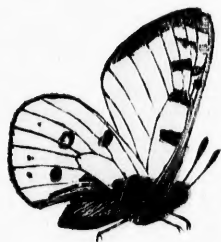


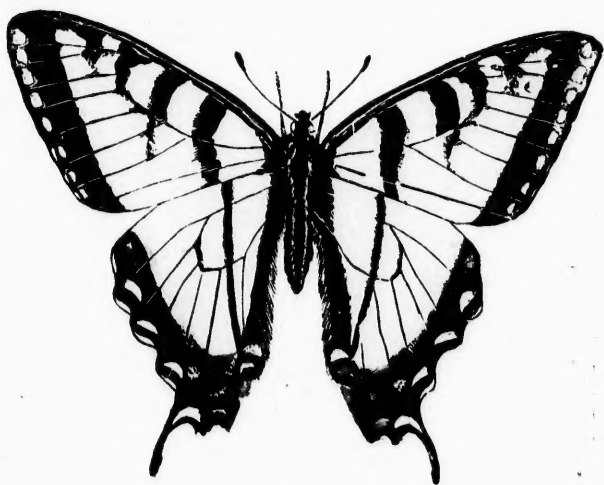
PLATE I.



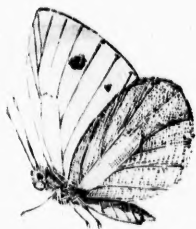
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EXPLANATION OF FIGURES ON PLATE I.

1. *Papilio turnus*. 2. *Parnassius smintheus*. 3. *Neophasia menapia*. 4. *Pieris rapae*. 5. *Nathalis iole*.



A
MANUAL
OF
NORTH AMERICAN
BUTTERFLIES.

BY
CHARLES J. MAYNARD.

ILLUSTRATED WITH TEN HAND-COLORED PLATES, AND MANY WOOD-CUTS.

O. J. Westcott

BOSTON:
DE WOLFE, FISKE & CO.
1891.

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INTRODUCTION.

In bringing together for the first time, descriptions of all the species of Butterflies which occur in North America, north of Mexico, I have experienced considerable difficulty. It has been impossible for me to see specimens of some species, hence I have been obliged to compile descriptions in quite a number of cases, and scattered as the literature upon this subject is, through publications in this country and abroad, the task has not been an easy one; but as I have in the majority of species consulted original descriptions, the compilation can be relied upon as being correct.

As this book is intended for the use of the tyro as well as for the advanced student, I have avoided the use of technical terms as far as possible, reducing the various methods of descriptions to a uniform system. Thus I trust that this work will be readily comprehended by every one who desires to consult its pages, without first being obliged to learn the peculiar applications which those who make the study of Butterflies a specialty, have seen fit to give to the various parts of these insects. Professional specialists are too apt to overlook the fact, that the average student who wishes to know something of every class of animal about him, has no time to learn a peculiar system of nomenclature with each; while simple designations are intelligible alike to the amateur and professional student.

I have, in every species, made the description as short as possible, using, where I could do so, the comparative method, as being less confusing. In order to facilitate identification, not only is a colored plate given of one species of nearly all the genera, but wood cuts are given of some portion of about two hundred and fifty species, illustrating some peculiar character by which the insect may be known. Both plates and wood cuts have, with a single exception, been drawn and engraved by myself.

The arrangement given is that published by Mr. W. H. Edwards in his catalogue of 1884. I have used it because I think it the most likely to meet with the approval of the greater portion of entomologists

in America; personally, however I think the arrangement of butterflies given in my *Butterflies of New England* preferable. By the term type, applied to the species figured in the plates, I simply mean that it is the type selected by me for comparison, for one reason or another.

The description, unless otherwise stated, always applies to the male. In regard to the status of the species given, I have done little besides follow Mr. Edwards. I have made a few changes, and have added a few species and sub-species to the list, but nothing essential. In this branch of zoology, as well as in others, we find two classes of opinions regarding what shall constitute a species; the one being satisfied with minute differences, the other looking for more prominent characters as means of separation. Personally, I believe that in many cases, species are separated by closely drawn lines, this varying with different genera; that is, some genera are more susceptible to change than others. I am also inclined to think, that among these, as well as among other animals, well defined species appear more quickly than is generally supposed, a conclusion which I think is borne out by the history of the Cabbage Butterfly in America, which, since its importation from Europe in 1857, has produced several well marked forms which are looked upon by many as sub-species.

In matter of nomenclature, I have used trinomials to designate sub-species, and in one case, quadrimomials to designate a variety of sub-species. This method is a clumsy one and must in the near future give place to something more simple. We have arrived at a point in the study of zoology where many of us see the necessity of carefully recording the present status of species, sub-species, and even of more minute divisions among animals, for the benefit of students of the coming generations, hence we feel the want of some system of nomenclature different from that now in use.

I have endeavored to give descriptions of all the species of Butterflies which have been taken within our limits, but as many new species and sub-species have been described and added to the fauna since the appearance of Mr. Edwards last catalogue, (1884) and as the notices of these are scattered through a variety of publications, it is possible that some may have been omitted. Many species not given in the body of the work have been given in the appendix, hence this should be consulted if any given species cannot be found in the main portion of the book.

I am much indebted to Mr. Edwards' excellent catalogue for greatly facilitating my labors. I am also under obligations to Mr. Samuel

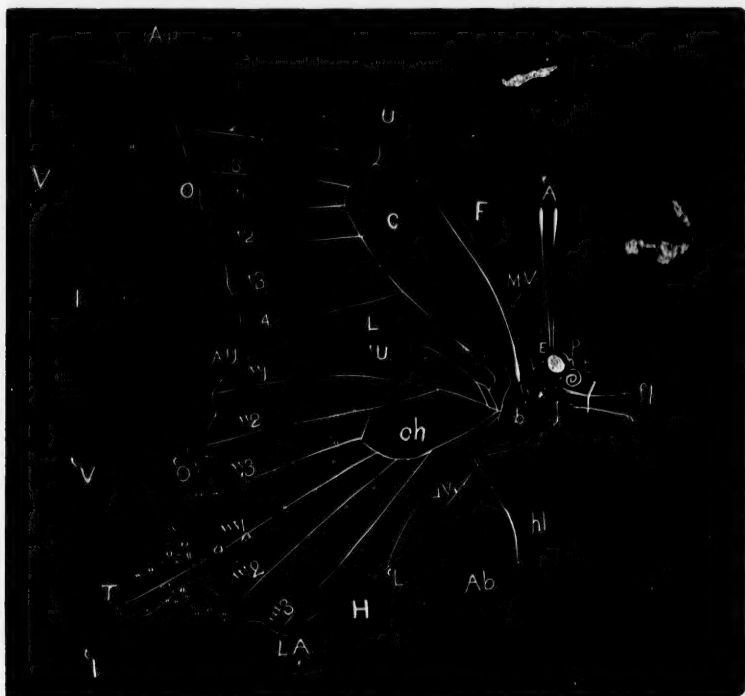
Henshaw, for his kindness in aiding me in the prosecution of my work; Prof. Edw. T. Owen and several other friends, to whom I have given due credit in the work, have kindly loaned specimens.

On another page will be found a cut of a butterfly, with an accompanying explanation of the terms I have applied to the various parts.

C. J. MAYNARD.

NEWTONVILLE, MASS., MAY. 1891.

DIAGRAM SHOWING PARTS OF A BUTTERFLY.



EXPLANATION OF FIGURE.

PAPILIO CRESSPHONTES.

F, fore wing; H, hind wing; A, antennae; E, eye; P, palpi; t, tongue; fl, fore leg; hl, hind legs; b, body; A^h, abdomen; U, upper border fore wing; Ap, apex; O, outer border; L, lower border; V, upper vein; 1, 2, 3, its branches; I, lower vein; '1, '2, '3, its branches; C, central cell; Mv, marginal vein; 'U, upper border hind wing, 'O, outer border; 'L, lower border; LA, inner angle; AU, upper angle; M V., marginal vein; 'V, upper vein; "1, "2, "3, its branches; I', middle vein; ""1, ""2, ""3, its branches; LV, lower vein; ch, central cell; T, tail.

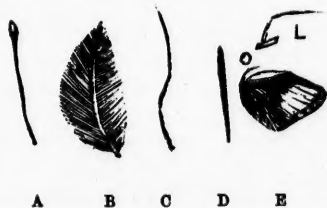
NORTH AMERICAN BUTTERFLIES.

RHOPALOCERA. BUTTERFLIES.

ANTENNAE, THREAD-LIKE, TERMINATING IN A CLUB-LIKE EXPANSION. WINGS, AT LEAST THE ANTERIOR, ELEVATED WHEN IN REPOSE. FLIGHT, DIURNAL.

Although the four families of scaly-winged insects grouped together under the above heading, do not constitute an absolutely natural division, all of our butterflies may be distinguished by the fact that they possess a combination of these characters. The antennae of moths are often feather-like, (Fig. 1, B.) that is there are bristle-like appendages to the joints of the antennae. Sometimes they are thread-like, (ib. C) but are not enlarged at the extremity. Some species of moths, however, possess antennae that are enlarged towards the extremity, notably the sphinges, (ib. D) but these not only differ widely in structure from butterflies, but the wings are never elevated when the insect is in repose (Fig. 2). Besides, the sphinges and many other

Fig. 1.



A, clubbed antennae of a butterfly; B, feathered antennae of a moth; C, thread-like antennae of a moth; D, enlarged antennae of a sphinx; E, hind wing of a sphinx moth, showing hook, o, enlarged at L.

moths possess a bristle-like expansion of the upper vein of the hind wings, (Fig. 1, E) by which they are, in a measure, caught to the front pair, a character never present in the true butterflies. Again, most all butterflies undergo their transformation from the larva to the perfect insect without spinning any cocoons, like most other *Lepidoptera*, but merely spin a button of silk to which they cling by little hooks (Fig. 3). Lastly, butterflies are diurnal in habit, moths, mainly nocturnal; that is, the first are active by day and the latter by night.

Fig. 3.



Chrysalis of butterfly,
Agraulis vanillae.

Fig. 2.



Butterfly with elevated wings,
Danais berenice.

Fig. 4.



Cocoon of moth,
Attacus promethea.

Family I. PAPILIONIDAE. Swallow Butterflies.

SIZE, LARGE OR MEDIUM. ANTENNAE, STRAIGHT, WITH THE CLUB ROUNDED AND PROMINENT, NEVER HOOKED. EYES, PROMINENT AND ROUND, NOT NOTCHED. CENTRAL CELL OF FORE WINGS CLOSED BY A STRONG VEIN (Plate I, 1). FORE LEGS AS COMPLETE AS THE TWO OTHER PAIRS. (Plate I, 1, shows a butterfly having six perfectly developed feet, and Fig. 2, on this page, one with only four.)

GENUS I. PAPILIO.
SWALLOW-TAILED BUTTERFLIES.

Size, large. Club of antennae, rounded. Secondaries, scalloped, and provided with prominent tails. TYPE *P. TURNUS* (Plate I, 1).

This family is divided by most authors into two sub-families, Papilioninae and Pierinae. The first containing only the genus *Papilio*, see Plate I, 1, and the second several genera, which do not have tails to the hind wings, but which have the inner margin of these wings bent so as to form grooves which enclose the abdomen when the wings are elevated, see Plate I, 2.

1. *PAPILIO AJAX* LINN.

GREEN-BANDED SWALLOW-TAIL.

Size, medium. Tails, long and slender, without terminal enlargement, Fig. 5, a. Above, brownish black with bands of greenish, one of which crosses both wings near the base; outside this is a second band, divided near the upper margin; both of these bands are suffused into particles near the lower angle of the hind wing. Outside these are two shorter bands on fore wing, and a long one follows the margin, becoming pointed below, and replaced on the hind wing by a series of crescent shaped spots. Near inner angle of hind wing are two scarlet spots. Beneath paler, markings similar, but with a narrow, greenish white line between the two long bands, outside of which, on hind wings, is a broad band of scarlet. The two spots near inner angle are lined above with greenish white, and there is a spot of whitish below the outer, and below this two bluish crescents. Tail, margined with whitish but is without central spot. Expanse, 2.00 to 3.50.

Habitat, Eastern U. S. from Penn., south, thence south-west to Texas, occasionally north to Hamilton, Ont.

Through the indefatigable efforts of Mr. W. H. Edwards, much light has been thrown upon the exceedingly complicated phases of coloration which individuals of this species assume. This is due, as Mr. Edwards has conclusively shown, to the effects of cold upon the pupa; hence the forms are regulated by the seasons. Formally, these phases of color-

tion were looked upon as evidence of specific rank, and the butterflies possessing them were considered distinct species. None of them, however, indicate even the presagement of a species, excepting perhaps *abbottii*, as noted below.

WALSHII Edw. is a winter form of medium size, with light areas as described, but the red spots on posterior angle of secondaries are fused together, and the tails are of moderate length, white tipped only, Fig. 5, d.

1a. *PAPILIO AJAX ABBOTTII* Edw., which appears to be a valid subspecies, owing its parentage always, however, to *walshii*, is similar to it in form but has a crimson streak on the secondaries above, outside of the lower portion of the outer of the two black bands that cross both wings.

TELAMONIDES Feld. is similar in bandings to *walshii*, but the size is a little larger, the dark areas are more extended, the red spots are usually either partly or wholly separated, the tails are long with the white tipping extending up on the sides, Fig. 5, a. This is also a winter form and stands intermediate between *walshii* and the next.

MARCELLUS Bd. is the summer form, derived from both the others, *walshii* and *telamonides*, hence ought to be, perhaps, regarded as typical *ajax*. It is larger and darker than the others, the marginal banding on the secondaries being so extended as to nearly obscure the upper and lower greenish crescent. The red spots have either become reduced to one, or the outer is represented by a mere point, and the tails are greatly elongated with the whitish margin extending their entire length, Fig 5, b.

Walshii appears in March and disappears about the first of June. *Telamonides* appears in April and disappears the last of June. About June first *marcellus* appears, remaining until the last of October. Although as far south as Florida, the main broods appear about the same time, some specimens are found a little earlier and fly a little later.

2. *PAPILIO PHILENOR* LINN.

ORANGE-BANDED SWALLOW-TAIL.

Size, medium. Tails, short, not enlarged terminally, Fig. 5, e. Above brownish black, with a greenish metallic luster. Sub-marginal row of spots on hind wing and sometimes on primaries, yellowish. Beneath, these markings are repeated but enlarged greatly on the hind wings, and there is an additional spot on the upper and lower margins, while all are partly orange. The body has a line of yellow spots along sides. There is also a marginal line of yellow spots on the hind wing, and the outer two-thirds is metallic greenish. Expanse, 3.55 to 3.80.

Habitat, U. S., excepting N. Eng. north of Mass.; also Ont.

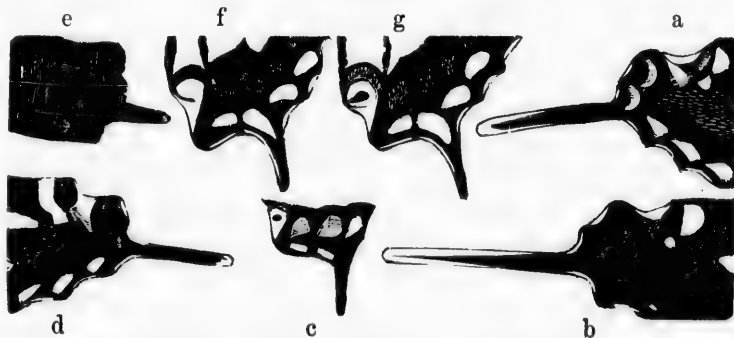
Occurs in the north in June and July; in the south from May until November.

3. PAPILIO MACHAON LINN.

SWALLOW-TAIL.

General coloration similar to the type, *P. turnus*, but the first dark band above that crosses both wings is wanting, this being replaced on the fore wings by a dusky patch that occupies the basal portion of the wing; the second inner band is shorter and does not cross the central cell. On the secondaries the upper and lower sub-marginal spots are yellow, not orange, and the marginal black band is widened and encloses a greater area of blue fields, these not only crossing the wing but also extending into the wide black marginal band on the primaries. The orange spot on posterior margin of secondaries is larger, not marginal, and has a narrow black line across its base which has the bulb scarcely

Fig. 5.



Tails and inner angle of some of the genus *Papilio*, a, *telamonides*; b, *marcellus*; c, *nitra*; d, *walshii*; e, *philenor*; f, *machaon*; g, *oregonia*.

enlarged. Finally, the tails are narrow, not enlarged terminally, Fig. 5, f. Below paler than above but with the markings repeated, but the triangular orange markings seen on the hind wings of *P. turnus*, inside the sub-marginal bands, are only slightly indicated. The light areas are larger than above. Expanse from 3.50 to 4.50.

Habitat, Europe, Asia, and as some entomologists affirm, it is found in Western North America, from California, northward. Most authors appear to think that only the following sub-species is found on our side of the Pacific, and some regard *oregonia* as a sub-species of *machaon*.

3a. **PAPILIO MACHAON ALASKA** Scud. Similar to *P. machaon*, but the hind margins to the hind wings are decidedly convex, the black is darker, less dusted with yellow scales, and there are decided black edgings to the veinings. Habitat, Western North America, from Oregon, northward, through British America, into Alaska.

4. **PAPILIO OREGONIA** EDW

OREGON SWALLOW-TAIL.

Similar to *P. machaon* but larger with the yellow areas narrow, the wings narrower and more produced, the black borders of hind wings broader, the tails longer, and the central spot in the orange area on inner angle of hind wing is more central, and has a decided bulb at its extremity, Fig. 5, g. Expands from 3.00 to 4.00.

Habitat, Oregon, Washington Territory, and Vancouver's Island.

5. **PAPILIO ZOLICAON** Bd.

BLACK AND YELLOW SWALLOW-TAIL.

Similar to *P. machaon* but differs in being smaller, the yellow is darker, being rather more orange, the dark areas are darker, especially at the base of the fore wings, and above all the black center to the orange on secondaries is oval and completely isolated, Fig. 6, e. Marginal spots on lower side of hind wings, orange. Expands 3.00 to 3.25.

Habitat, Oregon to Arizona; Montana; Colorado.

6. **PAPILIO AMERICUS** KOLL.

ARIZONA SWALLOW-TAIL.

Similar to *P. machaon* in general coloration but with a black center in the orange spot on the upper surface of secondaries; sides of body spotted as in *P. asterias*, instead of being lined as in *P. zolicaon*. The marginal spots on the hind wings below are orange as in *asterias*, as are also the spots constituting the central band of the under fore wings. Expands about 3.00. Habitat, Arizona.

7. **PAPILIO NITRA** EDW.

PALE SWALLOW-TAIL.

Size, small; tails of medium length and not expanded at tip, Fig. 5, c. Above, black, with a sub-marginal band of oval spots on both wings and a broad central band on both wings, widest on the fore wings, interrupted at the veins, and a triangular spot within this on the fore wings, all of yellow rather paler than in *P. turnus*. Between these two bands

on the hind wings is a band of pale bluish. On the inner angle is a pale orange spot inclosing an oval, black center. Beneath, the markings are repeated but all of the colors are paler, the black areas being dusted with yellow scales, especially in the central cell of the hind wings. Expands about 3.00. Habitat, Montana.

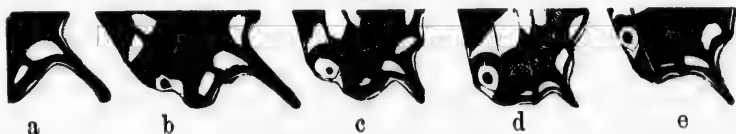
8. PAPILIO INDRA REAK

INDRA SWALLOW-TAIL.

Size, small, with the tails extremely short, Fig. 6, d. The black predominates and the general pattern of coloration is similar to that of *P. asterias*, but the inner band of yellow spots is more extended, these greatly exceeding the outer in width; on the hind wings are continuous or interrupted only by the narrow veinings; on the other hand, the blue spotting between the two bands is confined to the hind wings, and is much restricted even here. The orange spot is large, surrounding an oval center. There is an additional dot of yellow in the central cell of the fore wing, and a black dot in the second of the yellow spots of the inner band on the fore wings, near the upper margin. Beneath, the markings are repeated but, unlike *asterias*, only the upper and lower spots of the outer band of crescents are orange, and there are only slight traces of it on the outer portion of the inner band. The spottings on the sides of the abdomen are absent or are represented by a dot at the extremity. Expands 3.00.

Habitat, the mountains of Colorado, Nevada, and California.

Fig. 6.



Tails and inner angle of some of the genus *Papilio*: a, *bairdii*, b, *asterias*, c, *brevicauda*, d, *indra*, e, *zolicaon*.

9. PAPILIO PERGAMUS H. EDW.

CALIFORNIA SWALLOW-TAIL.

Similar to *P. indra* but with the light band on hind wings wider and the spot on the inner angle is simply surmounted with orange, not surrounded by it; but the tail is longer, being equal to that of *asterias*. Expands 3.20. Habitat, Southern California.

10. *PAPILIO BREVICAUDA* SAUND.

SHORT-TAILED SWALLOW-TAIL.

Similar to *P. indra* but the inner band of yellow spots are more restricted, are more or less tinged with orange on the lower surface in the male and on both surfaces in the female, while on the lower surface of the hind wings in both sexes, the outer band of crescent shaped spots are also tinged with orange; the orange spot on the inner angle of hind wings occupies only the upper two thirds of the light area, the lower being yellow, and the central dot is small. while the tail is longer, Fig. 6, c. The body is spotted as in *asterias*. Expands 3.00 to 3.52.

Habitat, Newfoundland, Anticosti, Labrador, and Quebec. Occurs in June.

11. *PAPILIO BAIRDII* Edw.

BAIRD'S BUTTERFLY.

Similar in form and size to *P. asterias*, but the male differs above in having the inner row of yellow spots which cross both wings expanded into a wide, continuous band as in *indra* and *brevicauda*, interrupted only at the veins. Beneath, this band is slightly tinged with orange on the hind wings but there is no orange whatever on the outer band. The blue band is more restricted both above and below, and the interspace between the two light bands toward the upper border of the fore wings is dusted with yellow scales. The tail and orange spot with its black center closely approximating the black of the inner side are much as in *asterias*, Fig. 6, b. Female scarcely differs from that of *asterias* above, but may be recognized by the absence of orange on the outer band of yellow spots on the hind wings, and there is but a slight tinting of this on the inner band. Expands 3.00 to 4.00. Habitat, Arizona.

12. *PAPILIO ASTERIAS* FAB.

BLACK SWALLOW-TAIL.

Above, black with two rows of yellow spots crossing both wings, between these on the hind wings is a rather wide band of blue and the lowermost spots on the fore wings of the inner band are blue. Within the bands near the apex of fore wings are two small spots, and at the outer extremity of the central cell a transverse band of yellow. There is a spot on the inner angle of the hind wings, orange above, yellow below, inclosing a black center: Fig. 6, b. Beneath, the markings are repeated with the yellow spottings enlarged, the lowermost on the inner band of fore, and both rows on hind wings are overwashed with orange.

Body, black, spotted on sides with yellow. Female, similar, but with only one row of spots crossing the primaries above. Expands 3.05 to 4.10. Habitat, United States generally, also Ontario and Quebec.

Occurs from April until November in Florida, and from June until September in Mass.

12a. *PAPILIO ASTERIAS ASTEROIDES* Reak. Similar to *P. asterias*; differs in having the inner row of yellow spots on the fore wings nearly obscured, excepting the spot on the lower margin which is considerably elongated. The inner row of yellow spots on the hind wings is also much obscured, and the blue band is broken up into small, round spots. Beneath, there is a row of large orange spots on the fore wings.

CALVERLEYI Gro. Male, with basal two-thirds of fore wing and basal one-third of hind wings, black without markings; a narrow bor-

Fig. 7.



Papilio turnus, upper side.

der on both wings is also black, but the interspace is yellow, becoming orange tinted on the hind wings, and there is a decided orange patch on the inner angle of hind wings without a black center. Beneath, similar, but the light interspace is wholly orange, interrupted only by narrow lines of yellow along the veins. Female, similar, but with a narrow transverse line of yellow crossing the outer end of the central cell on the fore wings; the yellow of the hind wings is strongly tinged with orange and the orange spot on the inner angle has a black center. beneath, there is an additional transverse line in the central cell of the

fore wings also yellow, and the line at the end of the cell is prolonged along the vein inwardly. This singular butterfly of which only two specimens are known, (one taken on Long Island in August, 1863, by Mr. Louis Fischer, and the other near Enterprise, Florida, in April, 1869, by Mr. T. L. Mead,) Mr. W. H. Edwards considers only as an aberrant form of *asterias* with the colors suffused to an extreme degree. (See remarks under head of Suffusion in the introduction.) I am inclined, however, to look upon it as an example of reversion toward some unknown ancestor.

13. *PAPILIO TROILUS* LINN.

GREEN-SPOTTED SWALLOW-TAIL.

Similar to *P. asterias*, but differs in having a rather shorter and wider, Fig. 8, d; in the absence of the inner band on the upper side of the hind wings, this being represented by orange-washed spots, one on the upper border and the other at the inner angle, this being without the black center; and in the band above on the hind wing usually being green instead of blue. Beneath, there are only six orange tinted spots on the inner band on hind wings, the third one from the lower margin being omitted and is replaced by an arrow shaped mark of somewhat defused, greenish scales.

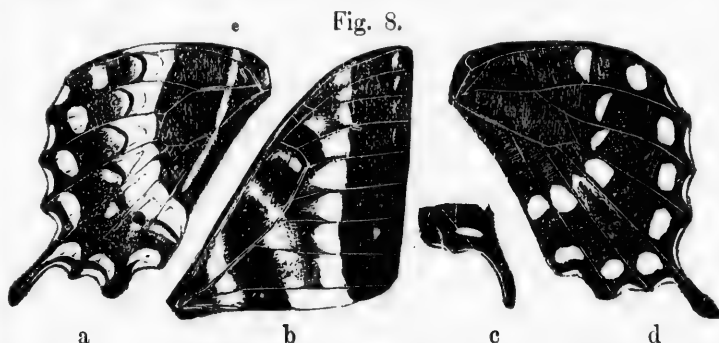
Habitat, Atlantic States from Mass., southward, and also the Western States. Occurs in April in Florida and disappears in November; in Mass., appears in June and disappears in September.

14. *PAPILIO PALAMEDES* DRU.

BROAD-WINGED SWALLOW-TAIL.

Wings, proportionally short and broad, with the tails broad and somewhat expanded terminally, Fig. 8, a. Above, dark reddish brown, with two rows of yellow spots crossing both wings, the outer of which are oval on the fore wing, but crescent-shaped on the hind wing; the upper on the fore wings are placed out of line the width of the spot nearer the outer border; in this row on the fore wings they are triangular, inclined to be crescent-shaped, but near the lower border and on the hind wings they are fused into a continuous band. Within these bands, near the upper border of the fore wings, is a triangular spot, and there is a dash crossing the central cell near the outer portion. In the inner angle of the hind wings is a black spot, enclosing a bluish crescent, and above and below it are orange edgings. Between the two light bands on the hind wings are obscure spots of blue, surrounded by

more or less scales of yellow. There is a line of yellow in the center of the tails. Beneath, the markings are repeated, but larger on the fore wings, and on the hind wings they are more or less overwashed with orange; on this wing, between the two bands, in the middle of the space between the veins, are dark patches, on the inner side of which are spots of blue scales, followed outwardly by a dusting of greenish-yellow scales. On the base of the hind wing, nearly parallel with the lower edge, is a line of yellowish, (Fig. 8, e) that is also more faintly indicated on the base of fore wing. There are two lines of yellowish on the sides of the body. Expands 3.90 to 4.75. Habitat, the Gulf States and north to Virginia. Appears in March, disappears in November.



Wings and tails of some of the genus *Papilio*. a, right hind wing of *palamedes*, lower side; b, right fore wing of *eurymedon*, upper side; c, tail of same species; d, left hind wing of *troilus*, lower side.

15. *PAPILIO TURNUS* LINN.

YELLOW SWALLOW-TAIL.

Plate I, 1, lower side of male; Fig. 6, upper side of same.

Size, medium. Tails, two, slightly enlarged terminally. Above, lemon yellow, with both wings margined all around, excepting on the lower border of the fore, and upper border of hind wings, with black. This margin is widest on the outer border of the wings, and here contains a band of yellow spots, which are oval on the fore wings and crescent-shaped on the hind, where the upper and lower spots are orange.

There is an orange spot on the inner angle of the hind wing, without a black center, above and below which is a blue spot. There are black bands on the wings as follows: one near the base crossing both wings, one outside of this on the fore wings joined to another outside, and between this and the marginal band is a shorter one. Beneath,

Naples yellow, and these bands are repeated, but the outer marginal are more or less dusted with yellowish, and the upper four yellow spots on the hind wings are overwashed with orange; inside this band, still in the black margin, is a band of bluish spots, against the lower three of which, on the inside, are orange spots. The sides of the body are striped with yellow.

Habitat, Eastern U. S. to the Mississippi Valley, thence southwest to Texas, north into British America to Alaska, also Ontario, Quebec and Newfoundland. Flies in Florida from April until November; in New England from June until September.

In Florida, both sexes of specimens of this species which I have seen, are very dark in color, the yellow being decidedly ochraceous of the same shade as in *P. cresphontes*; the bandings are heavy, and the upper surface of the hind wings lacks the sub-marginal bandings of blue spots almost entirely; showing that this is not an approach to *glaucus*. On the other hand, in northern Mass. the reverse is the case, the yellow being paler and the bandings comparatively narrow, with the blue well indicated.

GLAUCUS Linn. Melanotic female. This is a black form in which the pale markings in the outer margin remain as in the type, and the blue markings are more extended, but the remainder of the wings is more or less blackened; occurs from New York, southward and westward.

16. *PAPILIO EURYMEDON* Bd.

PALE YELLOW SWALLOW-TAIL.

Similar to *P. turnus* in size, form, and general markings, but the tails are rather more slender, the yellow of the ground color is very pale, often nearly white beneath, but the dark bandings are fully as black as in *turnus*, and only the two lower of the yellow marginal crescents in the hind wings are tinged with orange, while there is no orange within the blue band. The marginal band of yellow spots below, on the fore wings are fused together, making a continuous band, interrupted only by the narrow veinings. The bandings are wider above and below, Fig. 8, b. The larvæ appear to differ somewhat from those of *turnus*. Expands 3.50 to 4.00.

17. *PAPILIO RUTULUS* Bd.

WESTERN YELLOW SWALLOW-TAIL.

Form and size of *P. turnus* and the markings are about the same; the color, however, is deeper, being almost as dark as that of the Florida

examples of *turnus* of which I have spoken, but the blue banding is usually indicated. Beneath there is no orange on the hind wings, excepting on the spots near inner angle, and the yellow marginal band on the fore wings is not only continuous, but is somewhat widened at the upper border, Fig. 9, b. And the spot constituting the outer of the four bands, near apex of fore wing, above and below, is not only much restricted but does not contain a light center; compare Fig. 9, b, with Plate I, 1. Expands 3.50 to 4.25. Habitat, Pacific States, British Columbia and from Montana to Arizona.

17a. *PAPILIO RUTULUS ARIZONENSIS* Edw. Similar to *P. rutulus* but the fore wings are not as pointed; the tails are not as long and curve inward, Fig. 10, a, and the bandings are more extended and darker. Habitat, Arizona, New Mexico and Colorado.

17b. *PAPILIO RUTULUS AMMONI* Behrens. General color of wings, above and below, deep, but rather dull, orange, and all the markings above are more distinct than in the normal form. Habitat, Nevada.

Fig. 9.



Portions of wings of members of the genus *Papilio*. a, inner angle, upper side, hind wing, *polydamas*; b, apex of fore wing, lower side, *rutulus*; c, tails of *pilumnus*; d, tails of *daunus*.

18. *PAPILIO DAUNUS* Bd.

THREE TAILED SWALLOW-TAIL.

Size and general form of *P. turnus* but with the fore wings more pointed, and the hind wings deeply indented and provided with three tails, Fig. 9, d. The color is the same ochreous yellow seen in Florida specimens of *turnus* but there is no orange tinting on the marginal spots of the hind wings, excepting a slight overwashing on the lowermost. Beneath, this overwashing is also apparent but extends to a limited area in front of the blue band. Expands 4.00 to 4.50.

Habitat, Arizona to Montana, Utah, Nevada, Oregon, and Mexico.

19. *PAPILIO PILUMNUS* Bd.

BROAD-BANDED SWALLOW-TAIL.

Size and general form of *P. turnus* but with the three tails of *daunus*, Fig. 9, c, and the colors are much as in that species, but there is one less bar on the fore wings, caused evidently by the fusing of the divided second band; in fact, all of the black markings are greatly widened. The orange spot on inner angle of hind wing above is extended into the next outer cell, and all the marginal spots above on this wing are tinted with it; the orange inside the blue band is also more extended. Expands 3.80 to 4.50. Habitat, Arizona and Mexico.

20. *PAPILIO CRESPHONTES* Cram.

YELLOW-BANDED SWALLOW-TAIL.

Size, large. Tails, long and enlarged terminally enclosing a yellow spot, Fig. 10, c. Above, dark velvety brown with a band of ochreous yellow spots crossing the wing from apex of fore to base of hind; another crosses from upper border of fore to inner angle of hind, thus the two on the fore wing form a kind of cross. On inner angle of hind wing is a yellow spot, overwashed with orange, and above it is a bluish crescent. Beneath, these bandings become so greatly enlarged that the dark area is reduced to a central band, a marginal band, and a band and some rather defused lines in the central cell of the fore wings, the base of the hind wing is thus wholly yellow. The black band on hind wings encloses a blue band. There is an isolated spot of black in the termination of the central cell on a line with the black band, and the two upper branches of the middle vein are two orange spots. Fig. 10, c. Body, yellow, with dark line down back. Expands 5.35 to 5.50. Habitat from Mass., where it is rare, to Fla., and in about the same range west; has been taken in Ontario, Quebec, and St. Johns, N. B.

21. *PAPILIO THOAS* Linn.

THOAS SWALLOW-TAIL.

Size, about that of *P. cresphontes* but the fore wings are longer and more pointed, and the tails are longer, Fig. 10, b; color, similar, but there is an isolated spot of yellow on the lower side of the outer third of the central cell of fore wings above. This is repeated below but larger, and the dark lines in the cell are sharply defined. On the hind wing below, the orange spots in the center of the wing are restricted, but the black band is widened inwardly, so as to include the enlarged, black,

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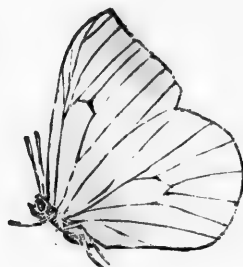
EXPLANATION OF FIGURES ON PLATE II.

- | | | |
|-------------------------|-----------------------|-----------------|
| 1. Anthocharis genutia. | 2. Callidryas eubule. | 3. Kri- |
| cogonia lyside. | 4. Colias philodice. | 5. Terias lisa. |

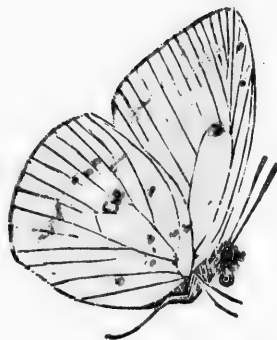
PLATE II.



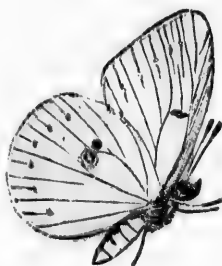
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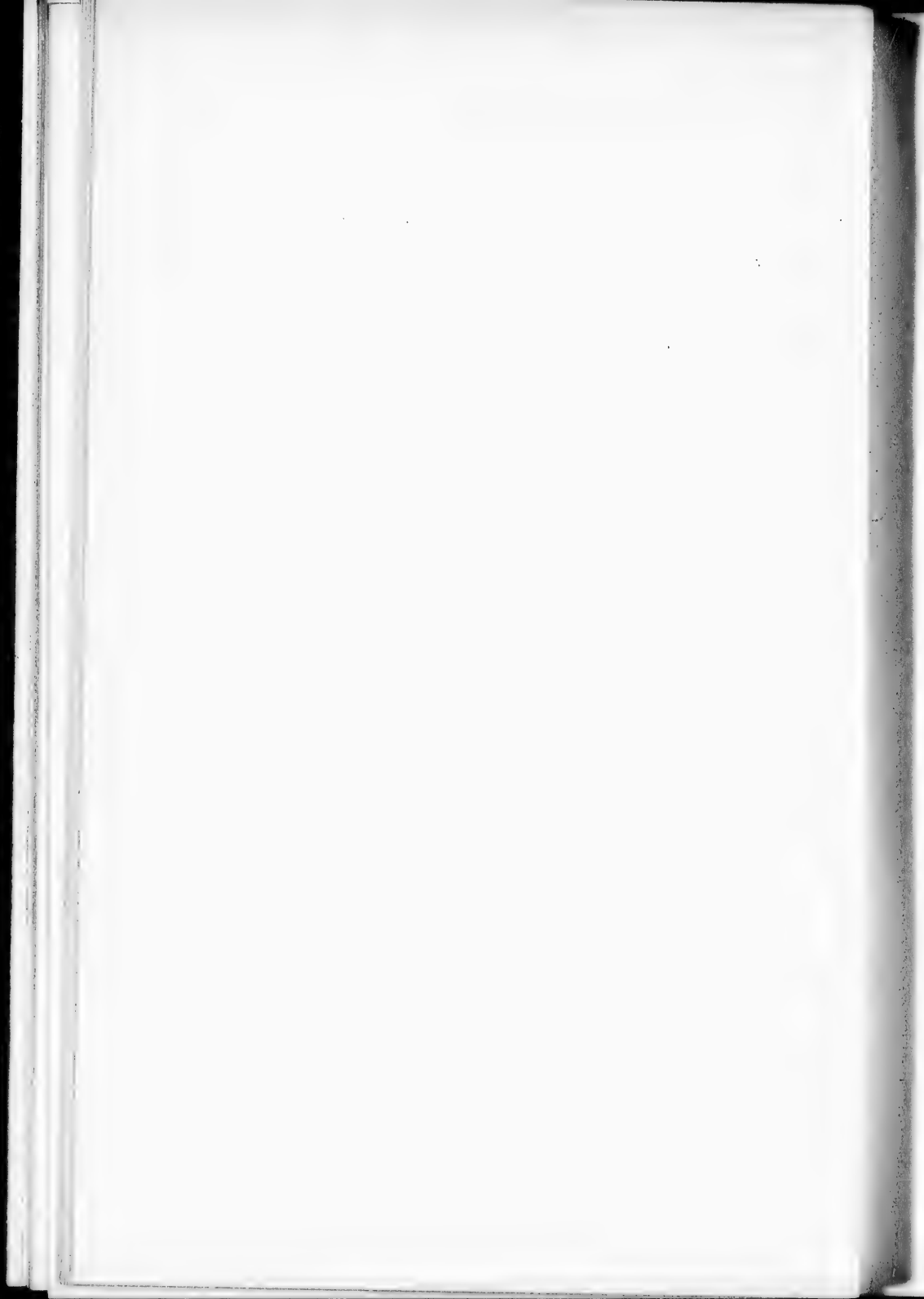


5

North American Butterflies.

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3. Kri-



scarcely isolated spot in the central cell, in its line, Fig. 10, b. Expands 5.00. Habitat, Southern Arizona, Texas, and probably Florida.

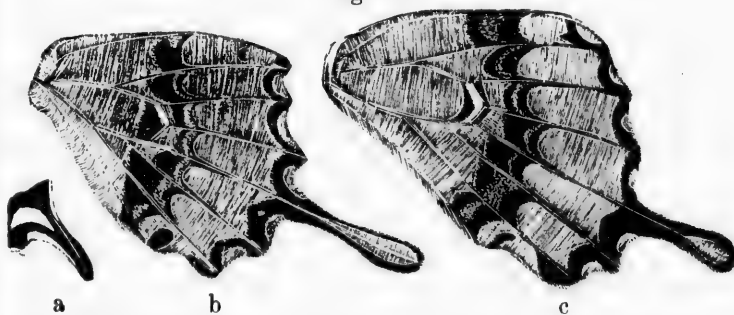
22. PAPILIO POLYDAMAS LINN.

RED-SPOTTED BLACK BUTTERFLY.

Size, medium. Tails, absent, but the posterior margin of the hind wings are quite deeply indented, Fig. 9, a. Above, dark brown with a greenish luster to the hind wings. A band of dull orange spots begins on the middle of the fore wings, extending to the lower margin, thence on to the hind wings, where it becomes continuous and reaches to the inner angle which is without a black spot. Beneath, darker, with a sub-marginal row of seven red spots on the hind wings, and with the orange spots repeated on the fore wings. Body, black, with a narrow orange stripe on side and orange spots on collar. Expands about 3.50.

Habitat, Cuba, Mexico, and occasionally Florida.

Fig. 10.



Illustrating the genus *Papilio*. a, *arizonensis*, tail; b, *theas*, left hind wing, lower side; c, *cressphontes*, same.

GENUS II. PARNASSIUS.

MOUNTAIN BUTTERFLIES.

Size, medium. Antennae, rounded, with club short. Wings, short and rounded, portions being semi-transparent; secondaries without tails or scallops. Colors, white or yellowish-white, conspicuously marked with spots of red or orange, usually with the former. Female, provided with a corneous appendage in the form of a pouch, situated on

the under side of the abdomen, Fig. 13, a. TYPE, *P. SMINTHEUS*. (Plate 1, 2.)

23. *PARNASSIUS CLODIUS* MEN.

FOUR SPOTTED MOUNTAIN BUTTERFLY.

Plate I, 2, lower side, female.

Male, with outer half of fore wings semi-transparent; above, creamy white; fore wings margined on outer, upper, and basal edges with dusky. A band of dusky nearly crosses the wing sub-terminally, and within is one much shorter, and two darker bands cross the central cell, one at the outer end and the other midway. Hind wings have the base and inner edge, blackish and there is a black-ringed red spot on the upper margin and another one, often represented by a mere black point, near the middle of the wing. Beneath, rather darker, with the bandings and spots repeated, but the latter usually are white-pupiled, as they also are occasionally above. Female, similar with bandings above more conspicuous, the second within the margin on fore wings, being nearly as long as the first. The outer three-fourths of the fore wings are semi-transparent. The hind wings have an additional band of sub-marginal dusky crescents; the red spots are greatly enlarged, white-pupiled, and below there are three or four additional red spots at the base of the wing, also a fused, double crescent-shaped spot on the inner angle, all black-ringed and white pupiled; these extra spottings are sometimes faintly indicated in the male. Pouch, large and white; Expands from 2.40 to 3.50.

Habitat, California, Utah, Nevada, and Montana. Occurs in July and August.

23a. *PARNASSIUS CLODIUS MENETRIESII*. Edw. Differs from typical *P. clodius*, in being smaller and in having all of the dark markings on fore wings paler; on the other hand, the hind wings are comparatively more deeply edged with black. The red spots are very small and pale often becoming simply pale pink or orange, but are always black-ringed. Beneath, yellower than above but there is no red spot on the inner angle. In the female, the colors are also pale and the inner angle of hind wing quite without red spots. Expands 2.25 to 2.50.

24. *PARNASSIUS SMINTHEUS* DOUBL.

EIGHT-SPOTTED MOUNTAIN BUTTERFLY.

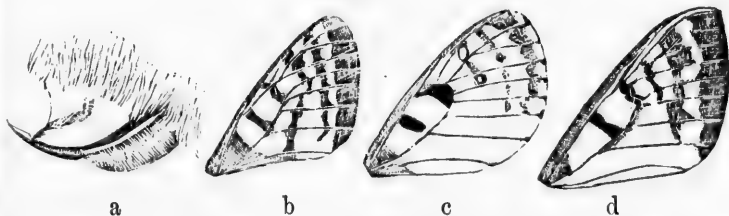
Differs from *P. clodius* in being white above, faintly tinted in female only, with creamy; in having the marginal band of fore wings broken

with a series of triangular white spots and the bands of central cell are wider and darker; and there are some black-edged, red spots, three in the female and occasionally also in the male, though sometimes all are wanting in the male, in the second short, dusky band without the central cell, Fig. 13, c. In the female, there is an extra black-ringed, red spot in this band near lower margin of wing, often present in male also. Below, the crimson spots are repeated and there are in both sexes, three or four black spots at the base of the hind wings, crimson-centered in the females and often in the males. There are two unfused red spots on inner angle of female, frequently represented by one in males. Pouch of female, black; Fig. 13, a. Expands 1.80 to 2.50.

Habitat, Rocky Mountains, Colorado to Montana, New Mexico, and Mt. Bradley, California. Occurs in June, July, and August.

24a. *PARNASSIUS SMINTHEUS BEIRII* Edw. Similar to typical *P. smintheus*, but differs in having the sub-marginal band on both wings much heavier, and in having the spottings always orange in the male, and frequently so in the female. Habitat, Nevada and Utah.

Fig. 13.



Illustrating the genus *Parnassius*. a, abdominal pouch of female *smintheus*, enlarged; d, right fore wing, upper side of *clodius*; c, same of *smintheus*; b, same of *evermanni*.

24b. *PARNASSIUS SMINTHEUS HERMODUR* H. Edw. Much darker on fore wings than the type, the whole upper surface being strongly tinged with smoky, nearly obscuring the dark bars, otherwise quite similar to the type form. Expands about 2.30. Habitat, Colorado, Montana, and British America.

25. *PARNASSIUS NOMION* FISCH.

ALASKIAN MOUNTAIN BUTTERFLY.

Differs from *P. clodius* in having the marginal dusky band on the wings interrupted by a marginal band of white spots as in *P. smintheus*, but the second inner band between the outer and the central cell is wanting, being represented by two dark spots, the upper of which contains a

crimson centre. There is a fused, double black spot on the inner angle of hind wing that contains two minute red spots. Expands, about 3.25. Habitat, Alaska.

26. PARNASSIUS EVERSMANNI.

EVERSMANN'S MOUNTAIN BUTTERFLY.

Differs from all other species of this genus which occur with us, in being deep orange yellow, markings most nearly resemble those of *P. clodius* but differ in having the second band within the marginal on fore wing longer than the first, completely crossing the wing, and there is an indication of an extra bar near base. Fig. 13, b. Beneath, the two red spots seen on the hind wings above are repeated with a white centre, but those at the base of the wing are fused into a nearly continuous patch. The black bar on the inner angle contains a nearly fused, double spot with a white centre. Expands about 2.50. Habitat, Alaska and Siberia.

26a. *PARNASSIUS EVERSMANNI* THOR. H. Edw. Differs from the type in being white instead of yellow, the black on the base of the fore wings is broader and the bands are wider. The red spots are more numerous, larger and darker. Expands 2.10. Habitat, Alaska and Siberia. This and the type form are exceedingly rare.

GENUS III. NEOPHASIA.

BLACK AND WHITE BUTTERFLIES.

Size, medium. Colors, white rather conspicuously marked with black. Wings, very thin. Head, thorax, and body, slender. TYPE, *N. MENAPIA*. (Plate I, 3.)

27. NEOPIIASIA MENAPIA FELD.

PINKISH BUTTERFLY.

Pinkish-white, with upper margin of fore wings, narrowly, and upper half of outer margin more widely, edged with black. There is a spot from the upper border crossing the end of the central cell, and the outer margin encloses five oval white spots. Body, black. Beneath, these markings are repeated but rather more restricted, and there is a narrow sub-marginal band of dusky on the hind wings, and the veins are narrowly margined with it. Body, black. Expands 2.00 to 2.20.

Habitat, California, Oregon, Washington Territory, Vancouver's I land, and Colorado.

NEOPHAEA MENAPIA SUFFUSA Stretch. Similar to typical *N. menapia* but with the markings more extended and rather more white in ground color. There is an interrupted marginal band of red on hind wing of female, and a small, elongated patch on the same wing of male.

GENUS IV. PIERIS. WHITE BUTTERFLIES.

Size, small to medium. Colors, white or pale yellowish with dull black markings. Antennae, longer than one half the length of the body, and the club is rather suddenly enlarged. Fore wings long and pointed, hind wings rather long but rounded and tailless; neither pair are especially thin. Body and thorax not as slender as in *Neophasia*.
TYPE, *P. RAPAE*. (Plate I, 4.)

28. PIERIS AMARYLLIS FAB.

TEXAN WHITE BUTTERFLY.

Size, about that of *P. ilaire*. Color throughout, dull white with a series of dusky crescent-shaped spots on the outer margin of fore wing. Habitat, Southern Texas and Mexico.

29. PIERIS ILAIRE GODT.

FLORIDA CABBAGE BUTTERFLY.

Above, dull greenish white, with extreme upper border of fore wings dusky, this narrows to a mere line in the middle and widens on base and apex, Fig. 11, f. There is a serrated margin of dusky on the outer border, widest above and narrowest below, but not reaching the lower border. The hind wings are without markings. Beneath the markings above are not repeated but the apex of fore wings and the whole surface of the hind wings are strongly tinged with ochereous yellow. There is a point of orange at base of hind wings and an orange collar. Expands 2.25 to 3.00. Habitat, Central and Southern Florida.

30. PIERIS MONUSTE LINN.

LARGER CABBAGE BUTTERFLY.

Similar to *P. ilaire* but differs in being larger, with the black on the fore wings more extended, covering the outer fourth of wing at apex,

and the hind wings have a line of dusky, triangular spots on the outer border. Expands 2.50 to 3.00. Habitat, Southern States.

31. *PIERIS BECKERII* EDW.

BECKER'S WHITE BUTTERFLY.

size, small; wings, thin. Color, white, marked in male, on apex of upper side of fore wings with about eight spots of dusky in two rows, one marginal and the other within this. There is a spot in end of central cell, containing a dash of white. No markings on hind wings above. Beneath, the markings of fore wings are repeated but enlarged, and there is an extra spot on the middle of the lower margin. The veins of hind wings are broadly margined (less so on lower branch of upper vein) with dusky scales that are tinged with greenish and orange, and these show a tendency to become fused near the outer border, and form a sub-marginal band, Fig. 11, e. Female, similar but there are two extra spots on fore wings, one to each row, forming bands nearly across the wings. The dusky veinings on hind wings, seen below, show more faintly above, and there is a marginal, and a partial sub-marginal row of spots. Below, similar to male. Expands 1.65 to 2.00.

Habitat, Nevada, Utah, Oregon, California, Washington Territory, Colorado, and Arizona.

Fig. 11.



Illustrating the genus *Pieris*. a, rapae, tip of fore wing, upper side; b, napi same; c, sisymbri, lower side, hind wing; e, beckerii, same; d, protodice, (female) upper side of fore wing; f, ilaire, apex, upper side fore wing.

32. *PIERIS SISYMBRI* BD.

CALIFORNIA WHITE BUTTERFLY.

Similar to *P. beckerii* but is smaller, with the markings on upper side of fore wings more extended, and square or rectangular, not triangular; the markings on the lower portion of hind wings are also darker, and the fused sub-marginal band is nearly black, forming arrow-shaped marks, Fig. 11, c. Expands 1.30 to 1.60. Habitat, California, Nevada, Colorado, and Arizona.

33. *PIERIS NELSONI* EDW.

NELSON'S WHITE BUTTERFLY.

Similar to *P. beckerii* but differs in having the markings on fore wings above, rather more sharply defined, and the spot at the end of central cell is confined to the interspace between the two veins, not extending above the upper, Fig. 12, a. Expands about 2.00. Habitat. St. Michael's, Alaska.

34. *PIERIS OCCIDENTALIS* REAK.

WESTERN CABBAGE BUTTERFLY.

White, with base of wings powdered with violaceous and grayish. There are two rows of grayish spots crossing the fore wings, one marginal and the other sub-marginal. Hind wings, with a marginal row of arrow-shaped spots. Beneath, the markings of both wings are repeated, but there is an extra spot near the inner-angle of fore wings, and the veins of the hind wings are broadly bordered with bright yellowish green. The apex of fore wings and whole surface of hind, are strongly tinged with yellow.

Differs from *P. protodice*, in having no spot on end of central cell of fore wings. Expands from 1.70 to 2.00. Habitat, Rocky Mountains to the Pacific, from California to Oregon, and north into British America.

CALYCE Edw. The above described is the summer form; the present is the winter and differs from the summer, in being whiter, only slightly tinged with yellow, but the black markings are rather more decided and there is a greenish overwashing below.

35. *PIERIS PROTODICE* Bd-LEC.

BANDED WHITE BUTTERFLY.

Male, white, faintly tinged with greenish, with a marginal row of triangular spots of dull black on fore wings, within which is a shorter row, the two being connected by faint edgings along the veins. There is a large spot at end of cell that encloses a curved transverse line of white, and below this, on the lower border of the wing, is another spot, paler than the last, and the bases of both wings are grayish, otherwise the hind wings are unmarked. Beneath, the markings are repeated and the veins of hind wings are margined with brown, tinged with orange and greenish. The tips of the fore wings are also overwashed with the same colors.



c, silymbri,
ng; f, ilaire,

Female, similar but with the markings of fore wing more extended, Fig. 11, d, and there is a broad, marginal band on hind wings, enclosing a row of large, diamond-shaped spots of white; there is also a spot at end of central cell, enclosing a curved transverse line of white. Expands 1.60 to 2.25.

VERNALIS Edw. Is a winter form, smaller, with the dark colors more prominent, therefore the two bands on fore wings are more often connected by decided markings in both sexes.

Habitat, from Mass., where it is rare, south to the Gulf of Mexico, and west to the Pacific, also British America.

36. PIERIS NAPI ESPER.

WHITE BUTTERFLY.

Size and form of *P. rapae* but differs above in having the dark tip-pings to apex of fore wings not confined to the space above the second branch of the middle vein; and in having the dark spot between the first and second, nearer the outer margin, Fig. 11, b; *ib.*, a, being *P. rapae*. Beneath, the hind wings and tip of fore, are yellowish green, not yellow, and the veins of the former are narrowly margined with brown scales. Expands 1.25 to 1.50. This is the type form, as it occurs in Europe. In this country, the following sub-species occur.

36a. *PIERIS NAPI OLERACEA* Harr. White above, with very little or no dark markings anywhere, and the upper margin of hind wing is pale yellow. *OLERACEA-HIEMALIS* Harr. is the winter form, with the dark markings rather more conspicuous and the upper margin of hind wing, pale orange. Habitat, from New England to Mich.; Ontario and Quebec.

VIRGINIENSIS Edw. is an aberrant form, with the surface white above but much obscured with brownish scales, especially on apex of fore wings, on upper border of both wings, and basal half of lower. Beneath, all of the veins are bordered with grayish. Habitat, New York and Ontario.

36b. *PIERIS NAPI HULDA* Edw. In this sub-species, the lines along the veins of lower side of hind wings are fused, that is, the dark scales spread over the entire surface. Habitat, Alaska.

36c. *PIERIS NAPI VENOSA* Scud. Has the veins of under side of hind wings broadly bordered with black, with the lines continuing of equal width quite to the margin of the wing. Habitat, California to British Columbia. *FLAVA* Edw. Is an aberrant, yellow form of this last, found in California.

36d. *PIERIS NAPI BOREALIS* Gro. Is most like typical *napi*. Habitat, Arctic America.

36e. *PIERIS NAPI FRIGIDA* Scud. Similar to *napi* but with the dark lines on lower side of hind wings paler and narrower. Habitat, Labrador and Anticosti.

36f. *PIERIS NAPI ACADICA* Edw. Similar to *frigida* but paler, with markings less distinct. Habitat, Newfoundland.

36g. *PIERIS NAPI PALLIDA* Scud. Similar to *napi* but with the colors white or pale yellow, and with the lines bordering veins, very faintly visible. Habitat, California to British Columbia.

36h. *PIERIS NAPI CASTORIA* Reak. Like the last, with faint spots on the fore wings.

37. *PIERIS VIRGINIENSIS* EDW.

EDWARD'S WHITE BUTTERFLY.

Similar to *P. napi* but differs in having the wings longer and narrower, Fig 12, b, with the ground colors much obscured with brownish scales above, but there are no dark markings above. All of the veins below are margined with brownish scales. Expands from 1.70 to 190. Habitat, West Virginia. Occurs in May and June only.

38. *PIERIS RAPAE* LINN.

CABBAGE BUTTERFLY.

Greenish white with apex of fore wings dull black, this being often nearly wanting and always confined to the border above the second branch of the middle vein, Fig. 11, a. There is a spot on the middle of the fore wings, and on upper border of hind wings, and in the female, a second on lower border, but in the male the spots are often wanting. Beneath, the spots on fore wings are repeated and the central is very rarely absent, even if not seen above. Apex of fore wings and whole of hind, ochreous yellow, and these portions and the base of wings above and below, are powdered with dusky. Expands 1.60 to 180.

Introduced from Europe and now found from Canada south to Georgia, west to the Rocky Mountains, and through British America to the Pacific. Occurs from April until November.

38a. *PIERIS RAPAE MARGINALIS* Scud. Has the dark markings rather more extended than in the type, and with the spots above always present. Habitat, Western States.

38b. *PIERIS RAPAE YREKA* Reak. Has the markings even more extended. Habitat, California.

38c. *PIERIS RAPAE MANNI* Mayer. With the markings of the type, but pale, clear yellow without any ochereous tint. Habitat, Georgia and Chicago, Ills.

38d. *PIERIS RAPAE NOVAE-ANGLIAE* Scud. With the usual markings but with the surface of both wings dull sulphur yellow. Habitat, New England and New York.

GENUS V. NATHALIS. DWARF BUTTERFLIES.

Size, small. Colors, yellow, with prominent dark markings. Antennae, short, but in the male longer than one half the length of the body. Fore wings, long and narrow, but with the apex rounded, without any angle on outer border. Hind wings much shorter than the fore, but narrower than long, and well rounded. There is a small, oval, naked, depression just over the central cell, near upper border of hind wings. TYPE, *N. IOLE*. (Plate I, 5.)

39. *NATHALIS IOLE* Bd.

YELLOW DWARF BUTTERFLY.

Plate I, 5, upper side, female.

Male, yellow above, with apex of fore wings, excepting narrow margin on extreme tip, two spots below this on outer border, one dot at end of central cell and another between the first and second branches of the middle vein, an elongated patch on lower border and another on upper border of lower wing, (neither of these patches quite reach the border) and some dots on outer border and along the outer portion of hind wings, dark brown. Beneath, the markings are repeated, excepting patch on apex of fore wings and upper border of hind wings, but not as prominent. The apex of fore wings, base, outer margin, and a band across the hind wing, are tinged with greenish. There is an elongated patch of orange along the basal two-thirds of the upper border of fore wings. Female, similar, but with the markings darker and more extended, there being an indication of a dusky line across the middle of the hind wings above. Expands 1.00 to 1.25. Habitat, Illinois, and Missouri to California, also New Mexico and Arizona.

39a. *NATHALIS IOLE IRENE* Fitch. Differs from the type, in the absence of the three black spots on outer borders of the fore wings below, and in having the base of the wing, instead of its outer margin, orange.

GENUS VI.

ANTHOCHARIS. MARBLED BUTTERFLIES.

Size, small. Colors, white or greenish white, with hind wings below marbled with greenish, and fore wings of male often conspicuously marked with black and orange. Antennae, shorter than one half the length of the body. Fore wings, rather short, with the outer margin produced into a more or less prominent angle. Hind wings long, wide, but well rounded, their width being a little more than three-fourths their length. TYPE, *A. GENUTIA*. (Plate II, 1.)

40. *ANTHOCHARIS LANCEOLATA* Bd.

BOISDUVAL'S MARBLED BUTTERFLY.

Size, large, outer portion of fore wing with prominent angle. White on both surfaces; above, dusky at base of wings, with a marginal border of indistinct white spots on apex and outer border of fore wings, within which is another small, dusky spot, and at the end of central cell is a sub-oval or crescent-shaped spot, Fig. 12, c. Hind wings, unspotted. Beneath, the spot at end of cell of fore wing, is repeated, and apex and upper border are sprinkled with a brownish-green tint; the hind wing is thickly marbled with the same but most heavily on the basal two-thirds, and there is an oblique white spot on the upper border. Female, similar but rather more heavily marked. This is the most slightly marked species above, of any that we have within our limits. Expands 1.40 to 1.90. Habitat, Northern California, Nevada, and Arizona. Occurs from April until July.

41. *ANTHOCHARIS CREUSA* DOUBL-HIEW.

CREUSA MARBLED BUTTERFLY.

Size, small, about that of *A. genutia*, but the outer border of fore wing is without prominent angle. White, with rectangular spot at end of central cell of fore wing, not reaching upper border. Apex, dusky,

enclosing a line of four or five white spots; the inner border of this area is composed of a darker, saber-shaped spot, point downward, Fig. 12. d, Upper border of wing, sprinkled sparingly with black. Base of both wings, dusky. Upper surface of hind wing, slightly marbled with dusky, lower surface, prominently and not very finely, with dusky and greenish. Expands about 1.60. Habitat, Southern California, Arizona, and Utah.

42. ANTHOCHARIS HYANTIS Edw.

HYANTIS MARBLED BUTTERFLY.

Male, white, similar to *olympia*, with bar at end of central cell, narrower and reaching upper border of wing; and there are two rows of dusky spots in apex. The marblings of hind wings beneath are green, gray, and yellow. Female, similar, but with the dark markings more extended. Expands 1.50 to 1.80. Habitat, Colorado, California, and Arizona.

Fig. 12.



a, fore wing, upper side, *Pieris nelsoni*; b, same *P. virginiensis*; c, same *Anthocharis lauceolata*; d, same *A. cerusa*; e, hind wing, lower side, *A. rosa*.

43. ANTHOCHARIS OLYMPIA Edw.

OLYMPIAN MARBLED BUTTERFLY.

Size, about that of *A. genutia*, but with outer border of fore wing without conspicuous angle, and there is no orange nor yellow above or below. The apex of fore wing is dusky, inside of which, on upper and outer border, is a darker spot, and there is a transverse spot at end of central cell. The hind wings are faintly marbled with dusky. Beneath, the markings are not repeated. The marblings on the hind wings differ from those of *A. genutia*, in being broken into three divisions, basal, central and on outer border; compare hind wing of *olympia*, Fig. 14, a, with that of *genutia*, ib. b. Female, a little darker and there are three blackish dots on outer margin of hind wings above. Expands 1.60 to 1.70. Habitat, West Virginia, Indiana, and Nebraska. Occurs as early as April.

44. *ANTHOCHARIS ROSA* EDW.

ROSE'S MARBLED BUTTERFLY.

Similar to *A. olympia*, but differs in being smaller and in having the markings of lower surface of hind wings, even more restricted but at the same time, rather more decided, Fig. 12, e. Expands 1.20 to 1.40. Habitat, Western Texas.

45. *ANTHOCHARIS AUSONIDES*. Bd.

LARGE WHITE MARBLED BUTTERFLY.

Larger than *A. olympia*, but of the same form and general coloration, but differs in having the dark area of fore wings broken by three white spots in the male, four in the female, and three divisions of marblings on hind wing below, are more connected, Fig. 14, c. The black spot at end of central cell of fore wing, is repeated below. The hind wings of female are tinged with yellowish. Expands 1.50 to 1.90.

Habitat, Colorado to California, and Arizona, British America, and the Youcon River, Alaska. Occurs in March and April.

45a. *ANTHOCHARIS AUSONIDES COLORADENSIS* H. Edw. Wings, rather broader than in typical *A. ausonides*, and the markings above are darker, while below the marblings are more extended.

46. *ANTHOCHARIS CETHURA* FELD.

CALIFORNIAN MARBLED BUTTERFLY.

Size and form of *A. genutia*, but differs in having the orange spot above, resting on the black bar on the end of the central cell, and the black spots on margin enlarged into diamond shaped marks, Fig. 14, d; the base of both wings is dusky, and the marblings of hind wings below are divided into three divisions, but these are not as distinct as in *olympia*, nor are the markings as coarse. Expands 1.40 to 1.50. Habitat, Southern California. Occurs in March, April, and May.

47. *ANTHOCHARIS MORRISONI* EDW.

MORRISON'S MARBLED BUTTERFLY.

Size of *A. cethura* and of similar form, but differs in having the bar at end of central cell, a little narrower and of the same width throughout, and the orange patch at apex is bordered with confluent spots, forming scallops. Beneath, the apical patch is rather deeper orange, and is surmounted with pinkish. The marblings below are rather more decided, leaving the interspaces clearer. Expands 1.50. Habitat, Kern River, California.

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48. ANTHOCHARIS THOOSA SCUD.

SCUDDER'S MARBLED BUTTERFLY.

White, with large, orange, apical patch which has a wide black bordering within it, extending from the outer to upper margin, and of equal width but with the edges roughened; outwardly it is only narrowly bordered with dusky. Hind wings unmarked, excepting a few clusters of dusky scales along veins. Beneath, the orange patch is restricted and yellowish, and the hind wings are marbled, much as in *A. julia*, Fig. 14, f. Expands 1.25 to 1.40. Habitat, Utah and Arizona.

49. ANTHOCHARIS SARA Bd.

SARA'S MARBLED BUTTERFLY.

Larger than *A. genutia*, with the angle of outer border of fore wings only slightly indicated. Differs in having the orange at apex of upper side of fore wing of male, nearly surrounded by a black border, Fig. 14, e, and the orange is seen more faintly below but without the black. The female has the orange on both surfaces but paler, and the black border is represented on the inside, by a bar at end of central cell; the apex is broken by three or four yellow spots. Expands 1.60 to 2.00. Habitat, California. Occurs from April until August.

REAKIRTH Edw. is the winter form, that has the black bordering within and without the orange on apex of fore wings, of male above, not only deeper in shade, but also much broader. The outer margin of the lower wings has a decided border of spots, instead of mere indications, and generally the marblings of lower side of hind wings, are coarser. The female differs in this respect, and in having the spot at end of central cell, crossing the vein and reaching upper border. Expands 1.30 to 1.60. Habitat, California. Occurs in March, April, and May.

50. ANTHOCHARIS STELLA Edw.

STELLA'S MARBLED BUTTERFLY.

Differs from *A. sara* in having the ground color rather brighter or more yellowish, and the dark line below orange apical patch narrower and broken through in the middle; this does not quite reach the upper border of the wing. At tip of wing and on outer margin, the black bordering is narrow. Hind wings, unmarked. Beneath, the orange is narrower and rather more widely bordered with dark. Hind wings, quite finely marbled with grayish green. Female, with ground color deeper and dark markings more extended; the orange patch is only about one half as wide and the dark band below it is narrower, with a series of

yellow spots over it. Expands about 1.40. Habitat, Nevada, California, Oregon, and Arizona.

51. ANTHOCHARIS JULIA EDW.

JULIA'S MARBLED BUTTERFLY.

Size and form of *A. genutia* but is very closely allied to *sara* in coloration and differs in having the black border of orange patch on fore wing above, more broken into spots, and the upper border of this wing is more finely sprinkled with dusky in both sexes, Fig. 14, f. The hind wings of both male and female are also slightly marbled above, and more coarsely marked below. Expands 1.40 to 1.50. Habitat, Colorado, New Mexico, Arizona, and Montana. Occurs in June.

Fig. 14.



Illustrating the genus *Anthocharis*. a, lower side, hind wing, olympia; b, same, genutia; c, same, ausonides; d, upper side, fore wing, cethura; e, same, sara; f, same, julia; g, antennae, (enlarged) genutia.

52. ANTHOCHARIS GENUTIA FAB.

ORANGE-SPOTTED MARBLED BUTTERFLY.

Plate II, 1, upper side, male.

Male, above white with an interrupted margin of black on outer border of fore wing, and a patch of orange at apex. There is a dot of black at the end of central cell, and some dusky sprinklings on the upper border, while the hind wings are faintly marked with dusky. Beneath, white with the dot on fore wings repeated. The apex of fore wing is marbled with greenish, but is without the orange, and the hind wings are marbled with greenish and black. Female, similar but lacks the orange and has a little dusky in the apex of fore wings above. Expands 1.50 to 1.80.

Habitat, New York to Virginia, Western States, and Texas. Rare in Southern New England. Occurs in February and March in Texas, and further north in April.

53. ANTHOCHARIS PIMA EDW.

ARIZONA MARBLED BUTTERFLY.

Lemon yellow, dusky at base of both wings. Orange patch on fore

wings small, widely bordered outwardly with black which is broken by yellow spots along outer and upper margins and by orange scalings along veins. There is a large, rectangular spot at end of central cell, within which are two orange dashes. Upper border of wing, coarsely spotted, Fig. 15, a. Hind wings, slightly marbled. Beneath, the spot at end of central cell is repeated, but the apex of wing is greenish in lines along the veins, and the hind wings are marbled with greenish, coarsely, excepting on lower border, and the marblings have clearly cut edges.

Female, similar but with the dark markings more extended. Remarkable as being the only described American species, in which both sexes are yellow. Expands, 1.70 to 1.75. Rare. Habitat, Arizona, Pima County. Occurs in April.

GENUS VII. CALLIDRYAS.

CITRON AND ORANGE BUTTERFLIES.

Size, medium. Colors, yellow or orange, without prominent markings. Antennae, short, gradually enlarged on the terminal third. Wings, rather short and rounded, being without prominent angles. Abdomen, not projecting beyond hind wings. TYPE, *C. EUBULE*. (PLATE II, 2.)

54. *CALLIDRYAS EUBULE* LINN.

CITRON-COLORED BUTTERFLY.

Male, yellow above with the outer border of both wings slightly lighter. There are a few blackish scales at end of central cell of fore wing, and a blackish marginal dot at the end of each vein. Beneath decidedly tinged with orange, and the bordering points are more distinct and connected by a narrow rufous, marginal edging. At end of central cell on fore wings, are two brownish spots, the upper of which is a mere dot, the lower larger, and enclosing a silvery center, overlaid with reddish. The elongated lower portion of this spot is cut by the closing vein of the central cell so that a small portion of the spot is within the cell. At end of central cell of hind wings, but within it, is a brown ringed silver spot, and above it, but nearer the outer border, is either a blackish or rufous dot, or a brown silver-centered spot and both are sometimes absent. Outside the spots, on both wings, is a wavy band more or less distinct of reddish brown, and an indistinct band through spots, and some dots on basal half of wings.

Female, brighter, more orange above, with marginal dots on fore wings, enlarged and connected by rosy rufous edges, as are the smaller ones on the hind wings. At end of central cell, and without it, is a small brown spot, and beneath it, without and within the cell, is a brown-ringed, orange spot. The hind wings show indications of the spots on end of central cell beneath. Beneath, there is a cluster of narrowly brown-ringed, silver spots, overlaid with red, at end of central cell of fore wing, and both spots on hind wings are always silver-centered, and a distinct bar passes outside of them. The rufous bandings are more prominent and there are several others on the hind wings. An exceedingly variable species, some of both sexes being much more orange tinted than others, with bandings exceedingly variable, and sometimes both sexes are sprinkled beneath with rufous. Expands from 2.00 to 2.75.

Habitat, Southern States, north to Virginia, Ohio, and Ills., casually to New York and Rhode Island, and also Arizona and Southern California.

55. CALLIDRYAS SENNAE LINN.

YELLOW-GREEN BUTTERFLY.

Male differs from *C. eubule*, in being of a clearer, more greenish, yellow on both surfaces, but more especially below. There are no black scales at end of central cell above on fore wings, and little or no indications of any marginal points. There is usually only one silver spot at end of central cell of hind wings; this is smaller and the edging is pale rosy rufous. The rufous bandings are mostly absent, or at best, only faintly indicated; but the most positive point of difference, may be seen in the spot at end of central cell of fore wings, this being reduced to a rosy-rufous, oval spot lying on the cross vein, compare Fig. 15, f, upper with ib. f, lower. The female is dull, orange yellow above and below, with all the markings rosy rufous, especially noticeable on the fore wings above and below, this often being without any silver center; in fact, the silver center, when present, on both surfaces is so strongly overwashed with rufous as to be nearly obsolete. The positive point of difference, however, is seen in this spotting below at end of central cell of fore wing. In this species, the spots are two only, that is, undivided by any decided lines or edging, compare Fig. 15, f, lower, *eubule* with ib., f, upper, *sennae*. Expands, 2.00 to 2.75.

Habitat, Central and Southern Florida, and Texas and Arizona. This and the preceding species occur from March to November in Florida.

55a. *CALLIDRYAS SENNAE ORBIS* Poey, Differs in being more or less white, but this form is confined to the female. Habitat, Southern Florida.

56 *CALLIDRYAS PHILEA* LINN.

ORANGE SPOTTED BUTTERFLY.

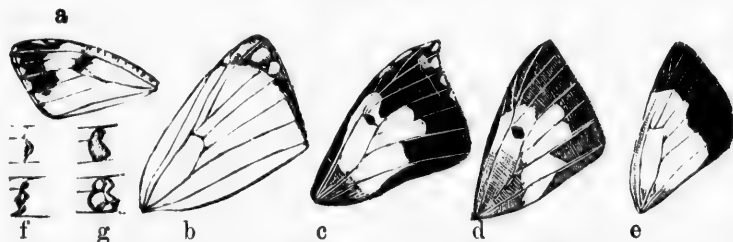
Similar to *C. eubule*, but differs in having a prominent orange border to the hind wing, and in the male in a patch of orange on fore wing, and the female has a marginal row of brown spots on both wings. Expands 3.00 to 3.25. Habitat, casually in Texas, Illinois, and Wisconsin.

57. *CALLIDRYAS AGARITHE* Bd.

LARGE ORANGE BUTTERFLY.

A little larger than *C. eubule*, but the male is orange above and orange tinted below, but scarcely more so than in heavily marked specimens of *eubule*. Female, dull orange not unlike that of *sennae*, but there is an elliptical spot of brown in the end of the central cell of fore wings without a light centre, and the margin is more heavily marked with brownish. Expands 2.25 to 3.00. Habitat, Florida, Texas, Kansas, Arizona and occasionally Nebraska.

Fig. 15.



a, fore wing, upper side, *Anthrocharis pima*; b, same, *Kricogonia fantasia*; c, same, *Colias eurydice*; d, same, *C. caesonia*; e, same, *C. meadii*; f, upper figure, central spot of fore wing, male, *Callidryas sennae*; lower figure, same, *C. eubule*; g, upper fig. same, female, *sennae*; lower fig., same female, *eubule*.

GENUS VIII.

KRICOGONIA. YELLOW-WHITE BUTTERFLIES.

Size, medium, Colors, white, white and yellow, or yellow, with no very prominent dark markings. Antennae, short, bent like a bow, with the club enlarging for

nearly or quite the terminal half. Wings, with more or less prominent angles on outer margin, especially on the front pair. TYPE, K. LYSIDE. (Plate II, 3.)

58. *KRICOSONIA* LYSIDE GODT.

YELLOW AND WHITE BUTTERFLY.

Above, white, green tinted, with basal third of fore, and extreme base of hind wings, lemon yellow. Apex of fore wings, yellowish-rufous, and there are a few brown scales on the cross-vein at end of central cell. Beneath, similar, but paler. Expands 1.70 to 2.00. Habitat, Indian River, Florida, and Texas.

TERISSA LUC. is the summer form, the above described being the winter, and differs in having a black bar about .15 long on the upper margin of the hind wings about two thirds the distance from the base, and the brown at end of central cell of fore wing is more prominent.

59. *KRICOSONIA* FANTASIA BUTLER.

BUTLER'S BUTTERFLY.

Above, grayish white, with base of upper border soiled sulphur yellow, with the apex and outer border of fore wing, pale brown, widest at apex where are some spots of white. Fig. 15 b. Beneath also white, and there is a patch of sulphur yellow in the central cell of fore wings. Expands 2.30. Habitat, Texas.

GENUS IX.

COLIAS. BORDERED YELLOW BUTTERFLIES.

Size, small to medium. Colors, usually yellow, occasionally orange, and rarely whitish or greenish, usually prominently bordered with black. There is a black dot at end of central cell of fore wing. Fore wings, long and pointed, often produced into an angle at apex. Hind wings, short and rounded. Antennae, about one half as long as body, with the club occupying one-fourth of the terminal length. TYPE, C. PHILODICE. (Plate II, 4.)

60. *COLIAS EURYDICE* Bd.

WESTERN DOG'S HEAD.

Male, above. Fore wings, with angle of outer margin, very prominent; spot at end of central cell, black with an opalescent luster and the middle of wing occupied by a patch of brilliant orange in the form of a dog's head, Fig. 15, c. There are a few spots of pinkish on upper margin, and a few of lighter on outer, all near apex. Hind wings, orange, lighter margined, unspotted. Beneath, orange, with wings edged with rufous; the black of fore wing is faintly indicated, and the central spot is white-centered. On the hind wings, there is a sub-marginal line of rufous points, and in the center of wing, a double, rufous, silver-centered spot. Female, unlike male in color, but of similar form. Pale yellow on both surfaces, deepest on hind wings, with a brownish central spot on both wings, which is darker below. Expands from 2.30 to 2.50. Habitat, California, Arizona, and Oregon. Occurs from May to August.

60a. *COLIAS EURYDICE AMORPHAE* H. Edw. is a sub-species differing from the type in having the dog's head interspace strongly suffused with purple. Female has a sub-marginal band of dusky on fore wings, and a brownish central spot. Habitat, California.

60b. *COLIAS EURYDICE BERNARDINO*. Smaller, without purplish suffusion, but with a narrow black border on hind wings. Expands 2.25.

61. *COLIAS CAESONIA* Stoll.

YELLOW DOG'S HEAD.

Color of *C. philodice*, but differs in having the border of fore wing wider, a border to the wing above, and the base dusky, forming a striking resemblance to a dog's head, Fig. 15, d. The female has a narrower border to hind wings than the male, and some yellow spottings in apex of fore wings. Expands, 2.25 to 2.50. Habitat, Southern State, up the Mississippi Valley, rarely as far as Minnesota, and from Texas to California. Occurs in Florida from April to November.

62. *COLIAS MEADII* Edw.

MEAD'S BORDERED BUTTERFLY.

Male; apex of fore wings pointed; bright orange above with opalescent luster. Both wings are broadly bordered with black and rose; the upper and lower margins of hind wings are greenish; the central spot on hind wings is only slightly indicated by a few blackish scales, Fig. 15, e. Beneath, greenish with basal two-thirds of fore wings, excepting

outer margin, orange. The central spot of fore wings is more prominent, and that on hind is green centered.

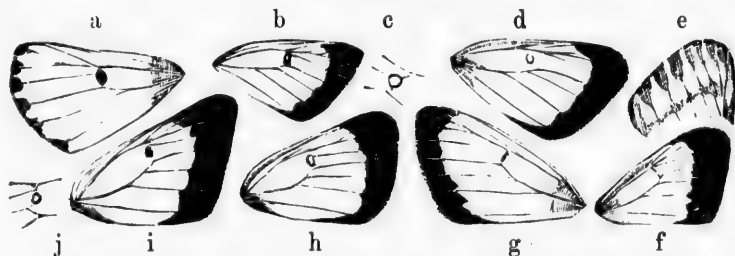
63. COLIAS HECLA LEF.

ARCTIC BORDERED BUTTERFLY.

Orange, with a black border to both wings. There is a small, black central spot on both wings, and an indistinct one with a pale center on hind. Beneath, greenish, darkest on base of wings. Female, differs in being more yellow, with wider bordering, and inclosing a few yellow spots. The central spot on fore wings is larger and the whole surface of hind wings beneath, is overwashed with dusky, but there is a sub-marginal row of almost confluent yellow spots. Expands 2.60 to 1.75. Habitat, Arctic Regions, from Greenland to Behring Straits.

64a. COLIAS HECLA HELA Str., darker than the type and the greenish yellow spots on lower border of hind wings beneath, are absent. Habitat, Hudson's Bay.

Fig. 16.



Illustrating the genus *Colias*, fore wing, upper side. a, boothii; b, hartfordii; d, occidentalis, male, e, same female; f, chippewa; g christina; h, alexandria; i, eurytheme; j, central spots left hind wing female, same species; c, same of occidentalis.

64. COLIAS BOOTHII CURT.

CURTIS' BORDERED BUTTERFLY.

Wings, rounded at apex, Fig. 16, a. Male, greenish yellow with a patch of orange on inner two-thirds of all but upper border of fore wings. There is a distinct central spot on fore wings, and a marginal band of black spots. Hind wings, with a marginal row of five spots not reaching lower margin. Central spot, orange and double. Beneath, similar. Female, differs in having a broad bordering band on both wings, enclosing a row of balloon-shaped spots. Expands 1.80 to 2.10. Occurs in July and August. Habitat, Arctic America.

64a. *COLIAS BOOTHII CHIONE* Curt. is smaller than typical *boothii* with marginal bordering absent, and the central spot on fore wing orange. The border is present in the female, but is not as much extended.

65 *COLIAS EURYTHEME* Bd.

ORANGE BORDERED BUTTERFLY.

Size of *C. philodice*, but the fore wings are more pointed, black bordering wider, Fig. 16, i, and the color above deep orange. Beneath, rather more orange, but with the markings the same as in *philodice*. Expands 2.30 to 2.50. Habitat, Western States to the Pacific, British America; rarely in Ontario, Quebec, and occasionally in Mass. and the Middle States. Occurs in July, August, and September and is the summer form.

ARIADNE Edw. is a winter form, lemon yellow with the basal portions of the wings more or less overwashed with orange, sometimes this being confined to the fore wings only, and the size is usually smaller. Occurs from February to July, and in elevated and northern sections, throughout the season. Those that I have seen taken in Mass. have been of this form. Expands from 1.30 to 1.80.

KEEWAYDIN Edw. is a winter form, dull orange, especially on upper surface. Expands 1.60 to 2.00. This form either follows *ariadne* in April and May, or in some sections, notably Northern Colorado on the mountains, in Oregon and Vancouver's Island, is the first and almost only form throughout the season; in other localities, *keewaydin* gives place to typical *eurytheme*, without being preceded by *ariadne*. There are albinos in every form and numerous intergrades.

66. *COLIAS PHILODICE* Godt.

BORDERED YELLOW BUTTERFLY

Fore wings without prominent angle on outer border. Male, sulphury yellow above, with both wings bordered on outer margin with dull black which is encroached upon only slightly by yellow along the veins. There is a black, yellow-centered spot at end of central cell of fore wings, and two of orange on center of hind wings. The extreme base of both wings is dusky and both pairs are narrowly bordered with rose. Beneath, the ground color is tinged with orange; the black border is absent, but there is usually a more or less distinct, submarginal band of points, rosy on hind wings, black on fore, and a spot of rose on upper border of hind wings, where the central spots are ringed with rufous and silver-centered. Female differs in having the bordering wider and enclosing a line of yellow spots. Expands, 1.50 to 2.00. Habitat, Atlantic States

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EXPLANATION OF FIGURES ON PLATE III.

1. *Heliconia charitonia*. 2. *Danais berenice*. 3. *Colae-
nis julia*. 4. *Agraulis vanillae*.

PLATE III.



excepting perhaps Florida, Mississippi Valley, Ontario, Quebec, and Nova Scotia. Occurs from early May until late in October.

66a. *COLIAS PHILODICE ANTHYALE* Hub. is smaller in size than the type, with the black bordering narrow and the markings below very decided. Sometimes the central spot on hind wings is single. Expands from 1.50 to 1.75. This sub-species I have taken in early spring in Mass.

ALBINIC Edw. is a nearly white form, confined to the female and usually appears in autumn, when it is common.

MELANIC Edw. is a black, or partly black, form, confined to the male and is rare.

Besides these forms, the species is subject to other variations, such as being orange tinted, (rare) borderless specimens, also rare, and many variations in the size of the central wing spot, etc., etc.

67. *COLIAS HAGENII* EDW.

HAGEN'S BORDERED BUTTERFLY.

Male, size, form, markings above and colors below, similar to those of *C. eurytheme*, but the orange above is replaced by the yellow of *philodice*. Female, similar to that of *eurytheme* but with the bordering less distinct, and the orange above is replaced by a yellow that is more ochreous than that of *philodice*. Expands from 1.50 to 2.00. Habitat, from Colorado and Utah into British America. Occurs in July and August.

68. *COLIAS ERIPHYLE* EDW.

ORANGE-TINTED BUTTERFLY.

Form and size of *C. eurytheme*, and the markings are similar, while the colors beneath are the same, but the color above is that of *philodice* with the base of upper border orange tinted, and the bordering is very pale, thickly dusted with yellow scales. Female, with bordering pale but present on both wings. Expands 1.70 to 2.00. Habitat, British Columbia.

69. *COLIAS HARFORDII* H. EDW.

HARFORD'S BORDERED BUTTERFLY.

Similar in form and size to the *keewaydin* form of *C. eurytheme*, but differs above in being dull lemon yellow without any orange tinting, and the black spot at end of central cell on fore wing, is smaller, more oval and light-centered, Fig. 16, b, and the border is pale brown in color. Expands about 1.60. Habitat, California.

70. *COLIAS OCCIDENTALIS* SCUD.

WESTERN BORDERED BUTTERFLY.

Size and general form of *C. philodice* but differs in having the black border on fore wing of male, projected more toward the base, and is not cut at all by the yellow veins; the central spot on fore wing is barely indicated, Fig. 16, d, and that on the hind wing is single; there are no sub-marginal spots. The female above differs even more, there being no bordering whatever on the hind wings and very little on the fore, Fig. 16, e. Beneath, the color in both sexes is very pale and the spot on hind wings is single, while that on the fore wing is barely indicated. Expands, 2.00 to 2.40. Habitat, Fort Simpson, British America, and Vancouver's Island. Occurs in July.

71. *COLIAS CHRYSOMELAS* H. EDW.

GOLDEN BORDERED BUTTERFLY.

Similar to *C. occidentalis* but differs in having marginal border wider, it being equal in width on both wings, and always cut by the yellow veins. Central spot on fore wings only slightly indicated and that on the hind wing beneath is single. The female has a more decided border to wings. Expands 2.00 to 2.50. Habitat, Northern California.

72. *COLIAS CHRISTINA* EDW.

CHRISTINE'S BORDERED BUTTERFLY.

Allied to *C. eurytheme* but male differs in having the border narrower, and the orange confined to the outer half of the intervening space. The central spot on fore wing is smaller, and that on hind wing is single on both surfaces. The female is greenish yellow above, without markings, excepting the single, central spot on both pairs of wings. Beneath, hind wings greenish, fore wings yellow, greenish at apex, and slightly orange tinted on basal third. Expands 2.10 to 2.50. Habitat, Slave River, south, Red Deer River, and Mount Judith, Montana. Occurs in July. Fig. 16, g, fore wing.

72a. *COLIAS CHRISTINA ASTRAEA* Edw. differs from typical *C. christina* in having the bordering wider, and the color yellower, being only slightly tinted with orange. Habitat, Yellowstone Lake.

73. *COLIAS ALEXANDRIA* EDW.

ALEXANDRIA BORDERED BUTTERFLY.

Male of about the size and form of *C. philodice* but differs in hav-

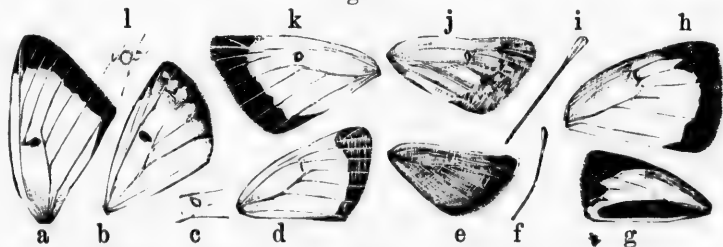
ing the border less extended along the upper margin of fore wing; in the central spot of fore wing being much smaller, Fig. 16, h, and absent or faintly indicated on hind wings. Beneath, very pale, the hind wings greenish without even the pinkish tinge, and spot in central cell of hind wing is single and only faintly indicated, not at all orange. There are no sub-marginal spots on either wings. The female is pale yellow without bordering. No spot in central cell above, otherwise as in the male. Expands 1.90 to 2.20. Habitat, Colorado, Montana, and British America.

74. *COLIAS EDWARDSII* BEHR.

EDWARD'S BORDERED BUTTERFLY.

Male differs from *C. philodice*, in the narrower border to wings, smaller central spot on fore wings, but better indicated than in *alexandria*, and the veins are not cut quite to the margin. There is no indication of a spot on hind wings above, but there is one below, rufous-ringed. There are no sub-marginal spots on either wings. The female resembles the male below; above the bordering is not only indicated rather more than in *occidentalis*, but is of a different pattern, Fig. 16, e. Expands, 2.10 to 2.30. Habitat, Nevada; Utah; Owen's Lake, Southern California; Mt. Hood, Washington Territory; Montana; Edmonton, British America.

Fig. 17.



a, *Colias edwardsii*, upper side of fore wing; b, same interior (female); c, same pelidne; d, same behrli; e, same nastes; f, scudderli; g, central cell, lower side, hind wing, edwardsii; h, same female interior; i, *Terias nicippe*, fore wing, upper side; j, same *T. jucunda*; k, antennae same species, twice life size; l, same, nicippe.

75. *COLIAS EMILIA* EDW.

OREGON BORDERED BUTTERFLY.

Similar to *C. alexandria*, but differs in having the borders of wings narrower, (cut to the margin by yellow veins) not extended along upper margin, but considerably along lower, the hind wings are of a different form, being much produced at outer angle and the border on this pair

does not reach the lower margin. Female has only an indication of a marginal border, and that is on the fore wings only. Expands, 1.90. Habitat, Oregon.

76. *COLIAS INTERIOR* SCUD.

BORDERED GREEN BUTTERFLY.

Male, smaller than *C. philodice* with the black bordering mainly confined to the upper fore wings, thus not reaching lower border. There are no indications of the sub-marginal spottings below, but the central spots of hind wings are double, and the upper border of fore, and entire surface of hind wings, sprinkled plentifully with greenish. The bordering on the female is confined to the fore wings and is only slightly indicated, Fig. 17, b. Expands 1.60 to 1.70. Habitat, Cape Breton Island, Lower St. Lawrence, Quebec, Nipigon River, and accidental at Waterville, Maine.

77. *COLIAS SCUDDERII* REAK.

SCUDDER'S BORDERED BUTTERFLY.

Male, about the same size as *C. philodice* but differs in having the black border less extended toward the base on upper margin, and the veinings cut the border to the fringe. The central spottings on fore wings are only faintly indicated, Fig. 17, k, and there are none on the hind wing. Beneath, the spots on fore wings are better indicated, while those on the hind pair are rosy-ringed and silver-centered. There are no sub-marginal spots. The outer margin of both wings are bordered with greenish, as well as the basal two-thirds of the hind wings, and in this respect, differs from *alexandria*, the male of which is very pale, greenish yellow only on hind wings. Female, with the bandings barely indicated on fore wings only, by two rows of faintly defined spots. As in most species of the genus, female albinos occur, of a pale greenish white. Expands 1.80 to 2.00. Habitat, Colorado, Montana, British Columbia, and British America. Occurs in July.

78. *COLIAS PELIDNE* Bd.

LITTLE BORDERED BUTTERFLY.

Male, closely resembles *C. p. anthyale*, especially those specimens having a single centre spot on hind wings. Differs, however, in the almost entire absence of the central spot of fore wings above, and in the absence of the submarginal row of spots beneath, and the outer border of wings is greenish. Female, white, or greenish white, above, wholly without markings; beneath, similar to male, but lacks the green-

ish bordering, and the fore wings are paler. Expands 1.50 to 1.70. Habitat, Labrador and Ungava Bay. Occurs in July. Fig. 17, d.

79. *COLIAS PALAENO* LINN.

PALAENO BORDERED BUTTERFLY.

About the size and form of *C. interior* but of a brighter yellow and with a narrower bordering to the wings. Female, also of a brighter yellow. Habitat, Labrador and Alaska.

80. *COLIAS CHIPPEWA* EDW.

HELEN'S BORDERED BUTTERFLY.

Male, similar to *C. p. anthyale* in size and ground color, but differs in having the border much wider and straighter on inside, not crossed by yellow veins, and in the absence of the central spot of fore wings, this being merely indicated. Beneath, this spot is also merely indicated on fore wings, and on the hind wings this is represented by a borderless silver spot, otherwise immaculate, but slightly overwashed with greenish. Habitat, Fort Simpson, St. Michaels, Alaska, and Kotzebue Sound. Fig. 16, f, fore wing.

81. *COLIAS NASTES* Bd.

GREEN BORDERED BUTTERFLY.

Male, above, greenish-yellow, dusk along veins and on a rather wide border on both wings, this border including a sub-marginal row of greenish spots. The central spot of fore wing is only slightly indicated, Fig. 17, j. Beneath, similar to above but paler, with the markings less distinct; central spot on fore wings encloses a white center, as does the rosy-ringed one on hind pair. Female, similar but with dark markings on veins, and margin more extended. Expands 1.50 to 1.60. Habitat, Labrador and Ungava Bay,

82. *COLIAS MOINA* STR.

STRECKER'S BORDERED BUTTERFLY.

Size and form of *C. nastes*, sulphury yellow, tinged with greenish. Black markings as in *nastes* but rather more decided and the central spot on fore wing is larger and black. There is a row of dark brown, marginal spots on both wings. Beneath, pale greenish, with the central spot on fore wings white-centered, and that on the hind wings is partly ringed with brown and reddish. Female, similar but little paler above. Habitat, Hudson's Bay.

83. COLIAS BEHRII EDW.

BEHR'S BORDERED BUTTERFLY.

Male, dusky-green with a distinct black border to both wings; the central spot of fore wing is a narrow white line without conspicuous edging, Fig. 17, e, and that of hind wing is a round dot. Beneath, similar but paler. Female, with the dusky markings restricted to the veins as in *C. nastes*, but differs in having the border without greenish spots, and in the central spottings being yellowish. Expands about 1.50. Habitat, Mountains of the Yo Semite, California.

GENUS X. TERIAS.

YELLOW AND ORANGE BUTTERFLIES.

Size, small. Colors, yellowish-white, yellow, or are orange, conspicuously bordered with black. Central dot on fore wings, present or absent, and there is none on the hind pair. Fore wings, not pointed and never produced into prominent angles, while the hind wings are rarely angled. Antennae, short, with the club occupying the terminal fourth. TYPE, *T. lisa* (Plate II, 5.)

84. TERIAS NICIPPE CRAM.

BORDERED ORANGE.

Male, above, bright orange with dash at end of central cell of fore wings, upper margin of fore wing, and outer margin of both pairs, dull black; lower margin of hind wings, yellow, interrupting the black border. Beneath, yellow, more orange on fore wings; both pairs, borderless, but central spot of fore wings is repeated, while apex of fore, and whole surface of hind wings, are marked with wavy lines and dashes of rufous that are inclined to form a band across the hind pair. Female, similar but paler, and the rufous bar on lower side of hind wings, is more prominent. Expands, 1.70 to 2.10. Habitat, Penn. to the Gulf of Mexico, Mississippi Valley, Arizona, California, and rarely New England. Occurs in Florida, from March until November. Fig. 17, b.

85. TERIAS PROTERPIA FAB.

ORANGE TERIAS.

Differs from *T. nicippe* in being of a redder orange, in having the black bordering confined to the apex of fore wings, not reaching either base or lower margin, and in the hind wings being without bordering.

The outer margin is much angled, as in *T. mexicana*, Fig. 18, e. Habitat, Texas and Arizona.

86. *TERIAS GUNDLACHIA* POEY.

GUNDLACH'S *TERIAS*.

Size and general form of *T. proterpia*; orange above, with a broad black border to upper and outer margin of fore wings. Beneath, pale orange on fore wings and whitish on hind. Habitat, Cuba, Texas, and Arizona.

87. *TERIAS MEXICANA* Bd.

MEXICAN *TERIAS*.

Outer border of hind wings, produced into an angle, Fig. 18, e. Pale yellow above, deeper on upper half of hind wings. There is a broad, black band on fore wings, encroached upon in the middle, by the surface yellow, Fig. 18, f, and there is a black border in middle of outer margin of hind wings. Beneath, also pale yellow, palest on basal two thirds of hind wings which are often nearly white. The only prominent markings are, a central spot on fore wings, and a brownish, broken bar, extending across hind wing, above the angle. Expands, 1.60 to 1.90. Habitat, Mexico, Texas, Arizona, Southern California and Texas, also rarely to Nebraska, Iowa, Illinois, Wisconsin, and Ontario, (Point Pelee). Appears to be extending its range north and east.

88. *TERIAS DAMARIS* FELD.

BROAD BORDERED *TERIAS*.

Form and general markings of *T. mexicana*, but color lemon yellow with a broader and more continuous border to both wings. Paler below with the hind wings more or less spotted with rufous. Expands, 1.25 to 1.60. Habitat, Arizona.

89. *TERIAS WESTWOODII* Bd.

WESTWOOD'S *TERIAS*.

About the size and form of *T. nicippe*. Orange above, with a narrow border of black around apex and along outer margin, Fig. 18, d. Beneath, yellowish, with brownish markings on hind wings. Habitat, West Indies and Texas.

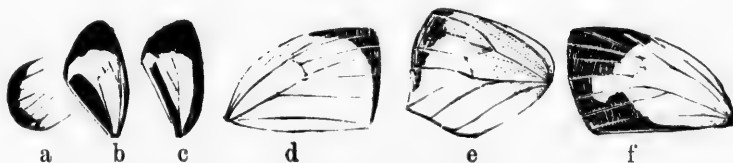
90. *TERIAS LISA* Bd-LEC.

LITTLE BORDERED YELLOW.

Plate II, 5.

Sulphur yellow with upper margin of fore, and outer margin of both pairs of wings bordered with black. The border does not reach the lower margin of the hind wings, and not always the lower border of the fore, and is less extended in the female than in the male, often being nearly absent on the hind wings. Spot on end of central cell, represented by a narrow transverse dash. Beneath, the border is absent, and there is a round, rufous spot on outer margin of hind wings, near upper edging, while the apex of fore, and entire surface of hind wings, are more or less marked with short bars of rufous and dusky, that in some cases are inclined to form bands. There is a yellowish white form (never wholly white) seen in both sexes, with markings similar. Expands, 1.05 to 1.45. Habitat, from Isles of Shoals (rare) through Eastern Mass. (not common) south to the Gulf of Mexico; also Western States, Arizona, and rarely in Hamilton, Ontario. Occurs from March to November in Florida, and in Mass. in July.

Fig. 18.



Illustrating the genus *Terias*. a, upper side hind wing, *elathea*; c, upper side fore wing, same species; b, same, *delia*; d, same, *westwoodii*; f, same, *Mexicana*; e, hind wing, upper side, same species.

91. *TERIAS DELIA* CRAM.

BANDED YELLOW.

Size and form of *T. lisa*, but differs in being paler yellow and in having a black band along lower margin of fore wings above a narrow, orange margin, Fig. 18, b, this band being more indistinct in the female where the orange margin is absent. Beneath, paler, with the rufous and brownish markings, but the round, rufous spot on hind wings is absent. Expands, 1.10 to 1.50. Habitat, Gulf States. Occurs in the summer.

92. **TERIAS JUCUNDA** Bd-Lec.**PALE-BANDED YELLOW TERIAS.**

Size and form of *T. delia*, and the markings above are similar, but differs in being white beneath, overwashed with grayish, without prominent markings, but the center of the fore wings are tinged with yellow. Expands, 1.25 to 1.45. Habitat, Gulf States. Occurs from March to October.

93. **TERIAS ELATHEA** Cram.**SMALL BANDED TERIAS**

General coloration of *T. jucunda* but differs in being smaller, in having the bordering to upper margin of fore wings entirely black, not overwashed with yellowish, and in the black, sub-marginal band of lower edge being narrower, Fig. 18, c, while the hind wings are white on both surfaces. not yellow above, and the bordering is more continuous, instead of being broken into spots toward the inner angle. Beneath, similar to *jucunda*. Female, with markings less distinct. Expands, 1.10 to 1.25. Habitat, Cuba and other West Indies. I have a single specimen in my collection, that I took at Enterprise, Florida, in May, 1886.

NOTE. For description of a species of *Terias*, allied to *lisa*, see Appendix.

Family II. NYMPHALIDAE. Field Butterflies.

SIZE, LARGE OR MEDIUM. ANTENNAE, STRAIGHT, WITH THE CLUB ROUNDED AND PROMINENT, NEVER HOOKED. EYES, PROMINENT. CENTRAL CELL OF BOTH WINGS, EITHER OPEN, OR CLOSED BY A SLIGHT VEIN.

Fore legs are usually incomplete. Compare Plate I, 1, with Plate II, 2.

GENUS XI.**HELICONIA. VELVETY BUTTERFLIES.**

Size, medium. Colors, black, conspicuously marked with yellows, reds, and other brilliant tints. Fore wings,

long and narrow, twice as long as wide. Hind wings, short and oval. Antennae, nearly as long as body. Central cell, closed. TYPE, *H. CHARITONIA* (Plate III, 1).

94. *HELICONIA CHARITONIA* LINN.

YELLOW-BANDED BUTTERFLY.

Above, velvety black, with six bands of lemon yellow, three to each wing, nearly parallel with lower margin of fore, and upper margin of hind, wings; the last two on hind, broken into spots. Beneath, paler, with lower row of spots on hind wings extending around outer margin. On lower margin of hind wings, are four crimson-lake spots, and an elongated one on base of upper margin of fore wings. Expands, 2.50 to 4.00. Habitat, Tropical America, some of the West Indies, and Florida, north to South Carolina. Occurs in Florida throughout the year.

GENUS XII. *DANAIS*. VEINED BUTTERFLIES.

Size, large. Colors, reddish, conspicuously veined with black below, and spotted with white. Wings, large and wide. Antennae, but little exceeding one half the length of the body. Central cell, closed. The males have a black tubercle in the cell below the central, on the hind wings. TYPE, *D. BERENICE*. (Plate III, 2.)

95. *DANAIS ARCHIPPUS* FAB.

MILK WEED BUTTERFLY.

Size, large. Color, above, reddish yellow with both wings margined and veined with black which on the outer margin, contains a double row of white spots, and there is a group of eight or nine reddish and white spots near upper margin of fore wing, Fig. 19, b. Beneath, Naples yellow on hind wings and on apex of fore, but the remainder of the latter is reddish, paler than above, and the markings on both are repeated, with the white spottings larger. Sexual spot appears only on the upper surface; body, spotted with white. Expands, 4.00 to 4.40. Habitat, from British America and Ontario, southward to the Gulf of Mexico and the West Indies, Occurs in Florida throughout the year, and in Mass. in July and August.

96. DANAIS BERENICE CRAM.

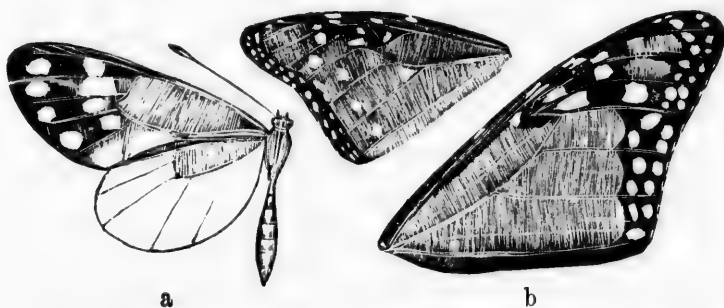
MAROON BUTTERFLY.

Plate III, 2.

Size, medium. Male, above, uniform maroon or yellowish chestnut. Upper margin of fore, and outer margin of both, wings, bordered with dull black, which on fore wings and on upper portion of hind, encloses a double row of white spots. There is a cluster of white spots on upper margin of fore wings, and a sub-marginal row of white spots. Beneath, paler, with the markings repeated, and the hind wings are black veined, and these veinings are narrowly edged with white, while the border has the double row of white spots. The sexual tubercle is seen on both surfaces, but is white-centered below. Female does not have the double row of spots quite reach the lower margin of fore wing, and is represented on the hind wing, by a single dot on upper margin. Body, spotted with white. Expands, 2.60 to 2.85. Habitat, Southern States to Colorado, New Mexico, and Arizona.

Fig. 19.

c



a, *Dircenna jermima*, upper side. b, *Danais archippus*, fore wing, lower side; c, same, *D. strigosa*.

97. DANAIS STRIGOSA BATES.

PALLIED MAROON.

Size of *D. berenice* and the general markings are the same. The fore wings are a little more pointed, and the general color is much paler; the spottings on border of hind wings are continued with more or less distinctness, the entire length of the border. Beneath, very pale, maroon only in the central cell of fore wings, and there is an additional white spot in the end of this cell, and another, of triangular form, between the

lower and middle branches of middle vein, near the central cell, Fig. 19, c, and the white edgings to the veinings are more conspicuous. Expands, 2.60 to 2.75. Habitat, Texas, Arizona, and Southern California.

GENUS XIII.

DIRCENNA. THIN-WINGED BUTTERFLIES.

Size, medium to large. Colors, dull red, more or less spotted with lighter. Antennae, more than two-thirds the length of the body. Fore wings, longer than twice the width; hind wings, short; and both are rounded at apex and are triangular. Body, long, projecting considerably beyond hind wings. See Fig. 19, a.

98. DIRCENNA KLUGII HUB.

HUBNER'S BUTTERFLY.

Form of *D. jermima*, Fig. 19, a. Reddish brown above, darker on apex of fore wings, and spotted with lighter. (For fuller description see Appendix.) Habitat, Mexico, rare in Southern Texas.

GENUS XIV. COLAENIS. RED LONG-WINGS.

Size, medium to large. Colors, reddish above, bordered, and often banded, but not very conspicuously, with black. Clouded below. Antennae, about three-fourths as long as body. Fore wings, longer than twice their width, rounded at apex. Hind wings, short, wider than long, and triangular. Central cell, closed. Body, not projecting beyond hind wing. TYPE, *C. JULIA*. (Plate III, 3.)

99. COLAENIS JULIA FAB.

JULIA'S BUTTERFLY.

Size, large. Male, above, bright reddish orange, whitish on inner fourth of hind wings, with prominent veins on fore wings, upper margin of fore, and band crossing obliquely from upper vein to outer margin of both wings, dull black. Within the bordering of hind wings, are two rows of narrow, reddish spots. Beneath, much paler, clouded with

darker; there is a narrow sub-marginal band of brownish which becomes most conspicuous in elongated spots of whitish, on upper and lower angles of outer margin of hind, and lower angle of fore, wings, and encloses elsewhere a reddish line. There are two minute, black-ringed, white spots at base of hind wings, outside of which is a small triangular spot of reddish, from which, to the outer margin of the wing, runs a dusky band. Female, much duller, with oblique, black band on fore wings, somewhat incomplete, but the borderings are wider. Beneath, the cloudings assume the form of more regular patches; the marginal band is more prominent; and the basal portion of upper margin of fore, and a bordering along the basal half of the band on hind wings, are whitish. Expands, 3.25 to 3.50. Habitat, Southern Florida and Texas.

100. COLAENIS DELILA FAB.

WEST INDIAN LONG-WING.

Similar in size and form to *C. julia*, but differs in being of a yellowish orange color above, in having the black bordering reduced to a narrow fringe, and the oblique band on fore wings, is represented by two spots, Fig. 21, d. Beneath, the cloudings are broken up into smaller patches. Habitat, Bahamas and other West Indies, and rarely, Texas.

GENUS XV.

AGRAULIS. RED WINGS.

Size, medium. Colors, red conspicuously marked with black above, and spotted below. Antennae, about two-thirds as long as the body. Fore wings a little wider than one half their length; hind wings about as wide as long. Body, not reaching to the extremity of the hind wings. TYPE, *A. VANILLAE*. (Plate three, 4.)

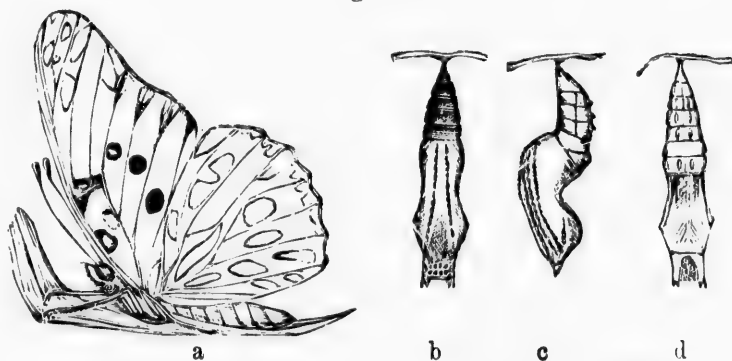
101. AGRAULIS VANILLAE LINN.

RED SILVER-WING.

Above, rich reddish-orange, with sub-marginal band of spots on fore wings, within which are three spots, at end of central cell, is a triangular spot, and in the middle of the cell are two spots, and all three of these cellular spots contain a dot of white. Hind wings, with a marginal band containing a row of reddish spots, while inside of this are three spots, all these markings being black. Beneath, on fore wing,

the black spots in central cell are repeated but enlarged, the other spots in the middle of the wing are also repeated, and a portion of those on outer margin. The ground color is not as bright but is tinted with crimson lake at base of wings. The apex of fore, and whole surface of hind wings, yellowish brown, spangled with numerous black-ringed, silver spots, as seen in Fig. 20. There are crimson points at the base of both wings. Female, with ground color, duller. Expands, 2.75 to 3.40. Habitat, Southern States, Arizona, and California, but has been taken at Coalburgh, West Virginia; Cape May, New Jersey; and Philadelphia, Pennsylvania.

Fig. 20.



Agraulis vanillae: a, lower side, b, chrysalis, front, c, same side, d, same back.

GENUS XVI.

ARGYNNIS. SILVER-SPOTS.

Size, small to large. Colors, usually orange or reddish orange above, conspicuously spotted and banded with black. With the majority of species, the hind wings beneath, are conspicuously spotted with silver. Wings, large, not pointed nor produced into prominent angles. Antennae, long, exceeding one-half the length of the body, and the club is flat and enlarged suddenly, occupying only a small portion of the tip of the antennae. TYPE, *A. APHRODITE*. (Plate four, 1.)

102. ARGYNNIS IDALIA DRURY.

REGAL SILVER WING.

Size, large. Sexes, differently marked. Male, fore wings, above reddish orange with outer marginal border undivided, and continuing around upper and lower margin. Markings, as in type but not quite as prominent. Hind wings, blue black, with two rows of spots, the inner bluish white and the outer orange. Central spot, black with base of wing within it, reddish, Fig. 21, b. Beneath, redder on fore wings, with markings repeated; additional silver spots on apex and on a sub-marginal band. Hind wings, more yellowish with yellowish silver spots as in Fig. 21, c. Female, differs in having the border on outer margin of fore wings above, wider and enclosing a row of yellowish spots, while both rows of spots on hind wing are yellowish. Expands, 3.00 to 3.80. Habitat, Maine to Nebraska, south to New Jersey and Pennsylvania, also Arkansas. Occurs from July to September.

ASHTAROTH Fish. is an aberrant form with only one row of spots above on hind wings, and with silver spottings beneath much extended.

103. ARGYNNIS DIANA CRAM.

DIANA BUTTERFLY.

Size, large. Sexes, utterly different on both surfaces. Male, above velvety brown, with outer third of both wings orange, crossed by dark veinings, and containing two, rather faintly indicated, rows of spots, Fig. 21, a. Beneath, pale orange, with outer third of fore wings unmarked, and with the inner third having the usual markings of the genus, but somewhat obscured by fusion, especially along veins. Hind wings, dusky on basal two-thirds, with three or four faintly indicated, silver spots; a band of elongated, black spots crosses the wing; and there is a sub-marginal row of black-ringed, crescent-shaped, silver spots.

Female, blue black above, with three rows of bluish spots crossing outer third of fore wing, and two on hind, the outer narrow, the inner broad, and enclosing a row of black spots. Beneath, greenish or reddish brown, tinged with purplish on the outer third of fore wings which are crossed by two rows of bluish spots, within which are about eight bluish spots arranged in a rather suffused pattern of black markings, as seen in the male. Hind wings, with two narrow, black-edged, whitish lines. Expands, 3.30 to 4.00. Habitat, West Virginia to Georgia, and from Southern Ohio to Illinois, also Kentucky, Tennessee and Arkansas. Occurs from July to September.

104. ARGYNNIS NOKOMIS Edw.

EDWARD'S SILVER-SPOT.

Size, large. Sexes, utterly different above. Male, bright reddish orange, with outer border brighter than in type, divided, and the pattern of fore wing as in type, with base of wing, dusky. Hind wings, with spottings as in Fig. 23, a, the third row of spots being separate, and basal third of wing dusky. Beneath, ochereous yellow, crimson lake on lower margin, and base of fore wing marked as above, but with silver spottings in apex. Hind wings, with wide space between first and second row of silver spots, the latter having a row of dusky spots outside them, and fewer silver spots within, about seven. Female, yellowish above, brownish at base of wings, and with the other markings of the male in a much fused and enlarged pattern. Fore wings, tinged with red. Beneath, similar to the male. Expands, 3.40 to 3.60. Habitat, Northern Arizona and Southern Utah.

105. ARGYNNIS NITOCRIS Edw.

STRECKER'S ARGYNNIS.

Sexes, unlike. Size, large. Male, above, reddish orange with basal half of wings obscured with dusky, with the usual wing pattern of markings, but the first three or four spots in outer row are fused and so rest on the outer line. The hind wings are marked much as in *A. nokomis*. Beneath, the fore wings are bright cinnamon-red, with the apex ochereous yellow, and a brown patch within the line of crescentic spots near apex, that contain three silver spots, while there are three or four silver spots in the first lunules, with other markings repeated. Hind wings, bright ferrugineous, as in *A. aphrodite*, in ground color. First row of silver spots, narrower than in *aphrodite* and edged inwardly with ferrugineous. In the second row, the seven spots are rather round; the first, second, and sixth, are about equal in size; third and fifth, long oval; seventh, semi-lunate, all heavily margined with black within. In the third row, the first and third are sub lunate, and the second, round, edged with black, and in the cell, is a round spot, and an oval one below it, both ringed with black. Expands, 3.00. Habitat, Southern Arizona to Nevada.

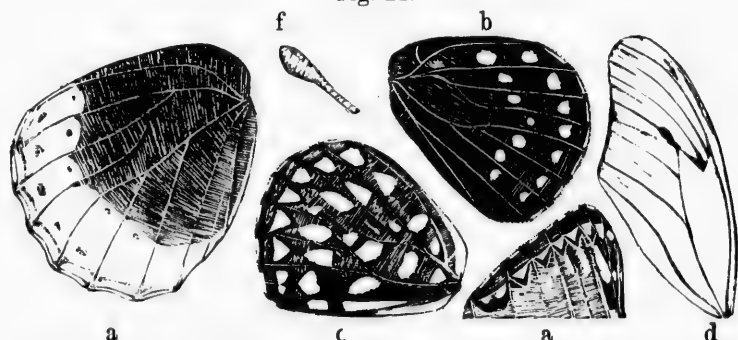
106. ARGYNNIS LETO Behr.

DUSKY SILVER-WING.

Size, form, and color above, most like those of *A. cybele*, but differs in having the sub-marginal row of crescents wider on upper side of hind

wing, and the third row of spots, nearly all fused together, Fig. 22, a, and one in cell below the central is heart-shaped and larger. Beneath, the colors are darker than in *aphrodite*, the apex of fore wings, and all but ocherous, sub-marginal space (which is as clear as in *cybele*) on hind wings, are overwashed with dusky. The silver spots of outer row are small; there are only six in the second row, the three upper large, and the remainder small, while within these, are only six basal; thus these spottings are reduced nearly, or quite, to the minimum. Sexes, strikingly unlike. Female, dark brown on basal portions of wings above with the usual markings outside of this, but the interspaces are ocherous yellow. Beneath, differs from the male, in being more dusky and in having the silver spottings larger. Expands, 2.60 to 3.00. Habitat, California, Oregon, Washington Territory, Nevada, and Montana.

Fig. 21.



a, *Argynnis diana*, upper side hind wing; b, same *A. idalia*; c, lower side of same; e, apex, fore wing, lower side of same; f, club of antennae, (enlarged) same species; d, fore wing, upper side, *Colacenis delila*.

107. ARGYNNIS CYBELE FAB.

YELLOW-BANDED SILVER-WING.

Size of *A. aphrodite*, or averaging a little larger, with the sexes not strikingly dissimilar, but differs in having the basal half of both wings, dusky, and the three upper, black spots of the third row on hind wings, are fused together, while to these, is often added, the fourth.

Beneath, there is no cinnamon red on the base of fore wings; the basal portion of the hind wings is paler; and the ferruginous does not encroach upon the ocherous yellow, between the first and second outer rows of silver spots. Expands, 2.75 to 3.35. Habitat, Atlantic States, and throughout the West to Nebraska, Ontario, Quebec, and Fort Edmonton, British America. Occurs in July and August.

107a. ARGYNNIS CYBELE CARPENTERII EDW. Differs from typical cybele in being smaller, darker in coloration above, and rather brighter below. Expands, 1.25 to 1.60. Habitat, Taos Peak, New Mexico, and Montana, and Nebraska.

108. ARGYNNIS APHRODITE FAB.

DARK SILVER-WING.

Plate IV, 1.

Size, large. Sexes, not essentially different. Above, reddish orange which is brightest on fore wings, with the base of wings but little dusky. Fore wings, not heavily marked; crescents on hind, not wide; and none of the spots in third row are fused together, while the two upper are placed farther from the margin than in *A. cybele*. All of the basal spots are clearly defined, not obscured by dusky surroundings. Beneath, usually the ferrugineous of hind wing, is brighter than in *cybele*, and this encroaches, more or less, upon the sub-marginal interspace, between the outer and second row of silver spots, and the basal portion of the wing. Silver spots, twenty-five or more. Markings below in this species, as in nearly all members of the genus, are variable and cannot absolutely be relied upon; thus the markings above on the hind wings, present the most positive points by which the majority of the species can be identified. Expands, 2.75 to 3.25. Habitat, Northern, Middle, and Western States, south to Tennessee, west to Nebraska, Montana, and Kansas, north to Ontario, Quebec, Nova Scotia, and Fort Edmonton, British America. Flies with *A. cybele* in New England, and northward in June and July; further south, is two brooded, occurring in June and September.

109. ARGYNNIS ALCESTRIS EDW.

FERRUGINEOUS SILVER-WING.

Size and general coloration of *A. aphrodite*, but differs in having the dusky at base of both wings above, not as extended, an additional round, black spot within the usual markings on hind wings, and the entire absence of any clear ochereous, sub-marginal border. Expands, 2.00 to 3.00. Habitat, Michigan, Illinois, Iowa, Montana, and Colorado.

110. ARGYNNIS CYPRIS EDW.

CYPRIS SILVER-SPOT.

Similar to *aphrodite* but with form of *nausicaa*, and the colors are about as bright, but the markings are even heavier, and the second spot on third row of hind wings above, is not as large. Beneath, the buff

although rather more extended on hind wing, is overwashed with dusky. Expands 2.75 to 3.00. Habitat, Arizona.

111. ARGYNNIS NAUSICAA EDW.

ARIZONA SILVER-SPOT.

Similar to aphrodite, but differs in being brighter in color, in having fore wings more pointed, and in averaging heavier markings above, the second spot in third row, on hind wing, being extended inward and fused with that of the fourth row, Fig. 22, b. Beneath, very bright on basal portion of fore wing, but there is less rusty red on hind wing, the interspace being comparatively clear, and the buff under coloring is also visible between other spots. Expands, 2.50. Habitat, Arizona.

112. ARGYNNIS LAIS EDW.

LAIS SILVER-WING.

Smaller than A. aphrodite, but with the spots on hind wings above, even more isolated. Beneath, the color of the sub-marginal band is clearer yellow. Expands about 2.00. Habitat, Fort Edmonton, British America.

113. ARGYNNIS ATLANTIS EDW.

MOUNTAIN SILVER-WING.

Smaller than A. aphrodite, of the same color above, but differs in having the upper half of marginal band of both wings undivided, Fig. 22, c, and in having the third row of spots mostly fused, as in cybele, Fig. 22, b. Basal portions of wings, dusky. Beneath, the ground color of hind wings is much more dusky, showing little ferrugineous.

Expands, 2.40 to 2.65. Habitat, Northern New England, New York, Iowa, Ontario, Quebec, New Brunswick, Newfoundland, and British America. Occurs late in July and August.

114. ARGYNNIS ELECTA EDW.

ELECTA SILVER-SPOT.

Form and general color of atlantis, but paler, markings slighter, bordering divided, and with fewer silver spots beneath. Expands, 2.10 to 2.40. Habitat, Colorado, Montana, and Los Vegas, New Mexico.

115. ARGYNNIS COLUMBIA H. EDW.

COLUMBIAN SILVER-WING.

Very similar to atlantis but somewhat resembles hesperis below. Habitat, Lakes Lahache and Quesnelle, British Columbia.

116. ARGYNNIS HESPERIS EDW.

HESPERIAN SILVER-WING.

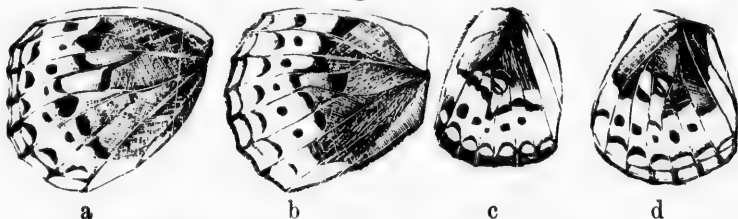
Size and general coloration of *A. atlantis* above, but differs beneath on hind wing, in having the ground color more rusty; the spots fewer, less than twenty-four, Fig. 23, b, and buff, not silver. Expands, 2.30 to 2.40. Habitat, Colorado, Utah, and Montana.

117. ARGYNNIS HIPPOLYTA EDW.

OREGON SILVER-WING.

Quite similar to *egleis*, but differs in having the markings above heavier; beneath the wings are rusty red, leaving only a very narrow sub-marginal interspace. Expands, 2.00 to 2.25. Habitat, Oregon.

Fig. 22.



Illustrating the genus *Argynnis*. Upper side hind wings: a, *leto*; b, *cybele*; c, *atlantis*; d, *nausicaa*.

118. ARGYNNIS BREMNERII EDW.

BREMNER'S BUTTERFLY.

Size, smaller than *A. cybele*, but of about the same color and general heavy markings above, the sub-marginal crescents on hind wings, however, being larger, Fig. 23, c, and the spots in the third row are fused their entire length. Beneath, the colors are more those of *atlantis* but with the ground color more rusty, and the silver spots within the second row are fewer, eight, not ten, and seven in first and second rows. Expands, 2.00 to 2.70. Habitat, British Columbia and Washington Territory. Occurs in July and August.

119. ARGYNNIS ZERENE Bd.

CALIFORNIA BUFF-WING.

Size of *A. atlantis* but resembles *hesperis*, and differs in having the third row of black spots on hind wings above, more continuously fused and wider, Fig. 23, d, with the markings on fore wings, heavier. Beneath, the buff spottings on hind wing are larger, on the second row and

basal portion of the wing, and on the latter portion, there are ten instead of seven, with a pinkish tinge to the buff interspace. Expands, 2.10 to 2.40. Habitat, California and Nevada.

120. ARGYNNIS MONTICOLA BEHR.

MOUNTAIN BUFF-WING.

Similar to *A. zerene*, but differs in having rather less cinnamon red on base of fore wing below, in being rather more rusty red on hind wings, and in having the clear interspaces strongly tinged with pinkish. Buff spottings as in *zerene*, Fig. 23, e. Habitat, Mountains of California, Nevada, Montana, and Summit, British America. Occurs in June and July.

119a. ARGYNNIS MONTICOLA PURPURASCENS H. Edw. Like the type, but differs in being smaller, in having heavier markings above, and with a decided purplish overwashing on the entire lower surface.

121. ARGYNNIS RHODOPE EDW.

WOOD SILVER-WING.

About the size of *A. monticola* but more heavily marked above, especially on hind wings. Beneath, the fore wings are deep, rusty red basally, and the hind wings are heavily washed with the same color, with little or no pale interspace, and this is never wholly clear. Spottings, smaller, especially the outer row of crescents, Fig. 24, a, and all are silvered, excepting the second row, and in the female, these being buff. Expands, 2.20 to 2.40. Habitat, British Columbia.

122. ARGYNNIS BEHRENSII EDW.

BEHREN'S SILVER-WING.

About the same size as *A. hesperis*, paler, but the markings above are similar, while the spottings are of the same number; form, and color of fore wings below, also similar, but the spots are silvered, and the ground color of hind wings is dark rusty red, as in *rhodope*. but there is a more or less clear interspace, Fig. 25, b. Expands, 2.20 to 2.40. Habitat, Mendocino, California.

123. ARGYNNIS HALCYONE EDW.

VELIE'S BUTTERFLY.

A little larger than *A. behrensii*, with about the same ground color, but the markings above are heavier, the under surface of the fore wing is paler, while the rusty of the hind wing, is about as deep in shade;

there are more clear spaces, and the silver spots are larger, Fig. 25, b. Expands, 2.50. Habitat, Colorado and Wyoming.

124. ARGYNNIS CORONIS BEHR.

PALLID SILVER-WING.

Size and color of *A. aphrodite* and the markings above are similar, but are even more isolated on the hind wing, Fig. 25, a. Beneath, while the cinnamon red is quite bright, the rusty is represented only by a pale washing, and the silver spots of marginal row on hind wings, are not as triangular. Habitat, Southern California; Shasta, California; Utah; Washington Territory; Montana; Belly River, and Crow's Nest, British America.

125. ARGYNNIS CHITONE EDW.

CHITONE BUTTERFLY.

Size of *egleis* but differs in being paler above, the rusty red of hind wings below is paler, the sub-marginal interspace is clear, and although there are no silver spotting on fore wings below, those of the hind wings are slightly silvered. Expands, 2.25 to 2.50. Habitat, Utah, Arizona, and California.

126. ARGYNNIS CALLIPPE Bd.

CALIFORNIA SILVER-WING.

Size of *atlantis*, with black marginal line nearly undivided, and the whole upper surface much obscured with dusky; there is a band of light spots crossing both wings, especially noticeable on the hind, Fig. 25, d. The colors beneath are paler, there being no reddish on base of fore wings, thus the clear spots are more extended, and the silver spots on hind wings are larger. Expands, 2.30 to 3.00. Habitat, California. Occurs in June.

127. ARGYNNIS NEVADENSIS EDW.

NEVADA GREEN-WING.

Wings, long and narrow, especially hind ones. Rather pale yellowish red above. Spots of third row on hind wings, fused together, and the one in the central cell is placed much nearer the margin than usual, in fact, displacing the spot in the second row, which is very small. Spot within these, in central cell, shaped like an inverted C, and within this are two small dots, Fig. 24, c. Base of wings, barely tinged with dusky. Beneath, base of fore wings and along veins, cinnamon, while the tip of these and hind wings, are mottled with greenish, usually surrounding the

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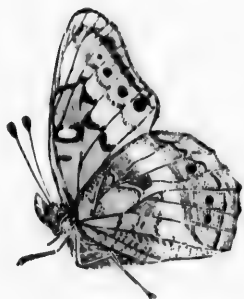
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EXPLANATION OF FIGURES ON PLATE IV.

1. *Argynnis aphrodite*. 2. ^{el}~~Euphrasia~~ *claudia*. 3. *Melita*
taea phaeton. 4. *Phyciodes tharos*. 5. *Eresia frisia*.

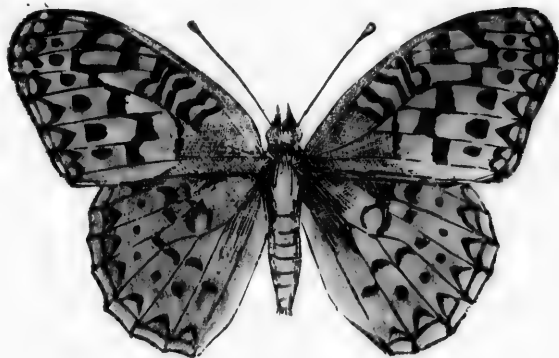
PLATE IV,



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5

North American Butterflies.

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silver spots which are about twenty-four; seven in first row, seven in the second, four in third (large), and five or six basal. Expands, 2.20 to 2.80. Habitat, Nevada, Utah, and Montana.

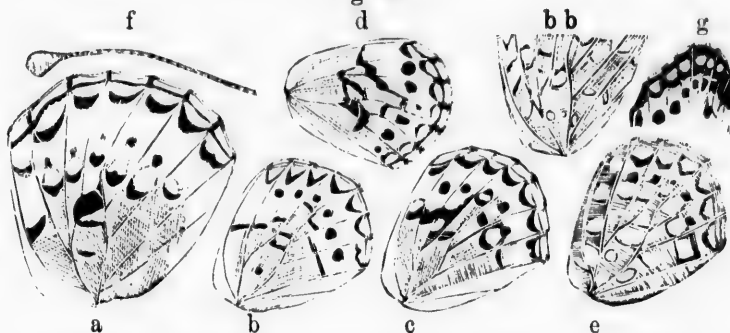
127a. *ARGYNNIS NEVADENSIS MEADII* Edw. Smaller than typical *nevadensis*, rather brighter in color, with the green beneath brighter and extended on to the margin of both wings. Expands, 2.20. Habitat, Colorado and Montana.

128. *ARGYNNIS EDWARDSII* REAK.

EDWARD'S GREEN-WING.

Larger than *A. nevadensis*, brighter in color above, with the third row of spots on hind wings above, not all fused, and the spot in central cell of second row is large, Fig. 25, c. Beneath, the green is extended over the entire surface of the hind wings. Female, much obscured with dusky above. Expands, 2.80 to 3.00. Habitat, Colorado, Montana, and the Blackfoot Reserve, British America.

Fig. 23.



Illustrating the genus *Argynnis*. a, upper side hind wing, *nokomis*; b, same, *hesperis*; b b, lower side same wing, same species; c, upper side same, *bremneri*; d, same *zerene*; e, lower side same wing, *monticola*; f, antennae (enlarged) same species; g, apex fore wing, upper side; *atlantis*.

129. *ARGYNNIS LILIANA* H. EDW.

LILIA'S SILVER-WING.

Size, form, and general coloration of *A. atlantis*, but differs in being much less heavily marked above, with divided border line, and having a distinct inverted C in central cell of hind wing above, Fig. 24, d. Beneath, on fore wings buff, more extended, encroaching upon central cell and extending along veins on lower margin; sub-marginal interspace on hind wing, clear. Silver spots are larger. Expands, 2.20 to 2.25. Habitat, California and Utah. Occurs in July and August.

BARONII Edw. is an aberrant form with marginal lines heavy and with some of the spots fused into bands, a peculiarity that I have seen assumed by other members of the genus.

130. ARGYNNIS RUPESTRIS BEHR.

BEHR'S BUFF-WING.

Smaller than *A. zerene* but about the same color above; differs in being more heavily marked, with the spot in central cell, in third row, placed nearer the outer margin of the wing, Fig. 26, a. Beneath, brighter red on the base of fore wings, and the outer sub-marginal row of spots are partly silvered, the remainder being wholly buff. Expands, 2.10 to 2.30. Habitat, California; Mt. Shasta, Mt. Bradley, and Weber Mountains, Utah.

130a. ARGYNNIS RUPESTRIS IRENE Edw. Differs from the type, *rupestris*, in being darker in color above, with the spots below on hind wing larger, with the sub-marginal band narrower,

131. ARGYNNIS LAURA Edw.

LAURA'S SILVER-WING.

Size and form of *A. altantis*, markings above nearly as heavy, but beneath, the colors are rather more red than even in *liliana*, and the sub-marginal interspace is proportionately as large as in *cybele* and as clear, but the silver spots are small as in *atlantis*. Expands 2.20 to 2.25. Habitat, California and Nevada.

132. ARGYNNIS MACARIA Edw.

MACARIA BUTTERFLY.

Similar to *coronis*, but smaller, brighter above, with the markings heavier, the crescents and inner border line of hind wing, being connected, and in the third row the spots are continuous, Fig. 26, b. Beneath, about as pale as in *nevadensis*, with very little red on basal portion of fore wings. Expands, 2.25 to 2.50. Habitat, California and Nevada.

132. ARGYNNIS INORNATA Edw.

PLAIN BUFF-WING.

Similar to *A. rupestris* in general markings, but differs in being paler, especially the female, in having the black bordering nearly undivided, much as in *atlantis*, and the spottings on hind wings are not as heavy, Fig. 26, c. Beneath, the red at base of fore wings and on outer

hind wings, is obscured with dusky, but as in *rupestris*, the buff, sub-marginal interspace is clear, and the outer, marginal row of spots is slightly silvered. Expands, 2.50 to 2.70. Habitat, California and Nevada.

133. ARGYNNIS SEMIRAMIS EDW.

SEMIRAMIS BUTTERFLY.

Similar to *coronis* but differs in being more lightly marked above, all of the spots on hind wings above being widely isolated, Fig. 26, d. Beneath, the colors are paler and the spottings smaller. Expands, 2.20 to 2.75. Habitat, San Bernardino, California.

134. ARGYNNIS ADIANTE Bd.

ADIANTE BUFF-WING.

Similar to *zerene* but differs in being paler above and more lightly marked, and the black borderings are very slight; beneath, paler, but with no silvering. Expands, 2.25. Habitat, Santa Clara Mountains, California.

135. ARGYNNIS ARTONIS EDW.

ARTONIS BUFF-WING.

Similar to *eurynome*, but differs in having no silver on spotting below, while the marginal spots of this surface are nearly obliterated on both wings. Expands, 1.50 to 1.90. Habitat, Colorado and Nevada.

136. ARGYNNIS CLIO EDW.

CLIO BUTTERFLY.

Similar to *eurynome* but differs in having no silver spots below, but the marginal spots of this surface are present. Expands, 2.00. Habitat, Montana, and British America, at Crow's Nest and Head of Peace River.

137. ARGYNNIS OPIS EDW.

OPIS BUTTERFLY.

Similar to *eurynome* but differs in being smaller with much lighter markings above, and border lines more or less divided. Fig. 26, a. Beneath, paler with the spots smaller, and varying with individuals, as to the amount of silvering, frequently, there being none; the sub-marginal spots of darker, are obsolete. Expands, 1.80 to 1.90. Habitat, Bald Mountain, British Columbia.

138. ARGYNNIS BISCHOFFII EDW.

BISCHOFF'S SILVER-WING.

Larger than myrina, and about as heavily marked on fore wings, but the third row of spots on hind wings is broken, the lower three, only, being fused, and nearly the whole of the lower half of the wing, and the entire bordering line, is dusky, Fig. 27, a. Beneath, similar to eurynome, but with the hind wing tinged with greenish. Sub-marginal interspace, clear. Female, more dusky above, with most of the interspace ochreous. Expands, 1.80 to 1.90. Habitat, Sitka, Alaska.

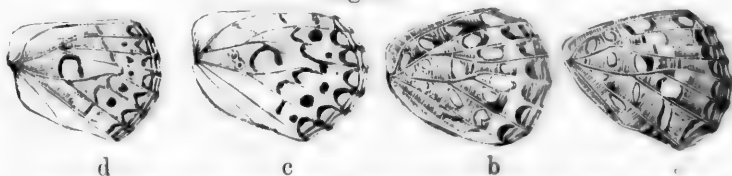
139. ARGYNNIS EURYNOME EDW.

EURYNOME BUTTERFLY.

Similar to atlantis, lighter above, with the marginal bordering undivided and the sub-marginal crescents are connected with it, while the inverted C in central cell of hind wing is isolated, Fig. 27, b. Beneath, rather paler, inclined to greenish on hind wings, but the sub-marginal interspace is clear buff, and the buff on fore wings is more extended toward the base. Spottings silvered on both wings. Expands, 1.70 to 2.00. Habitat, Colorado, Montana, and British America. Occurs in June and July.

ARGYNNIS EURYNOME ERINNA Edw. Similar to type above, but differs in being nearly covered with rusty red on lower surface of hind wings, leaving very little buff.

Fig. 24.



Illustrating the genus *Argynnis*. a, under side, hind wing, rhodope; b, same, behrensii; c, upper side same wing nevadensis; d, same, illiana.

140. ARGYNNIS MONTIVAGA BEHR.

MONTIVAGA BUFF-WING.

Similar to eurynome in size but differs in color, in having the sub-marginal spots silvered and others dull white, or more or less tinged with buff and all of the spots are black bordered. Habitat, Sierras, California and Nevada.

141. ARGYNNIS EGLEIS Bd.

EGLEIS BUTTERFLY.

Similar to *A. monticola* in color, smaller, and the sub-marginal line of crescents on hind wings are lighter, but all of the other markings are proportionately heavy, Fig. 27, c. Beneath, there is less rusty red; the sub-marginal interspace being comparatively clear, and the spots are more decidedly buff. Expands about 2.00. Habitat, California and Nevada.

142. ARGYNNIS MYRINA Cram.

SILVER-BORDERED BUTTERFLY.

Size, small, reddish orange above. Both wings have the marginal border and sub-marginal crescents connected, and within these is a row of spots; then the fore wings have the usual markings of members of the genus, but the base of hind wings is marked with an intricate pattern, seen in Fig. 27, d. Beneath, markings of fore wings repeated but more isolated, omitting the outer border which is replaced with rusty red that extends over the apex; and both wings have a sub-marginal row of silver spots, black-edged within on fore, and rusty edged on hind wings, where the black border is also replaced with rusty, and the wing within is checked with buff and rusty. There is a sub-marginal row of buff-ringed, brown spots within which are three rows of silver spots, and there is a silver-ringed black spot in central cell. Expands, 1.75 to 1.85. Habitat, New England to Montana and Colorado, north to Ontario, Quebec, Nova Scotia, British America, and Sitka, Alaska. Occurs from June until September.

143. ARGYNNIS TRICLARIS Hub.

HUBNER'S ARGYNNIS.

Similar to *A. myrina*; but differs in having no silver spots on border of wings below, and in having one central, and one basal row of silver spots on hind wings below, Fig. 27, e, with a row of silver dots in sub-marginal interspace. Expands, 1.50. Habitat, Arctic America; Labrador, and Colorado.

144. ARGYNNIS HELENA Edw.

SOUTHERN SILVER-SPOT.

Size and general appearance of *montinus*, but differs in being more buff below, there being a spot of this color, of a peculiar form, near the basal portion of the upper border of the hind wings below, Fig. 28, a.

White markings below much as in *chariclea*. Habitat, Mountains of Colorado, New Mexico, and Arizona.

145. ARGYNNIS MONTINUS SCUD.

MOUNTAIN RED.

Similar to *myrina* but differs in having the border lines above, separated from the sub-marginal crescents. Beneath, there is no bordering row of silver spots on fore wings, but one of small spots on hind wings, within which is a zigzag band of black, followed by seven dull, silver spots arranged as seen in Fig. 28, a, and the wing is decidedly angular on outer border. Expands 1.60 to 1.75. Habitat, White Mountains of New Hampshire. Occurs in July and August.

146. ARGYNNIS CHARICLEA SCHNEID.

DUSKY BUTTERFLY.

Similar to *myrina*, but differs in having a paler, less clear, ground color, with the extreme base of fore, and basal half of hind, wings, reddish dusky, nearly black. The bordering lines are much slighter and are separated from the more slender row of crescents. Beneath, no silver spots and the coloration is quite different. Both wings, similar to above but with markings fainter on outer half; other markings on fore wings, repeated, with apex yellowish. On hind wings, there is a central, transverse, whitish band, and within this, the wing is purplish brown, crossed by two zigzag bands of black, within which is a rather broad band of whitish, Fig. 29, a, followed by a black-pupiled, white dot in the central cell, and three whitish spots at base; upper border of wing, also white. Expands, 1.30 to 1.50. Habitat, British America and Greenland and Labrador. Occurs in June, July, and August.

146a. ARGYNNIS CHARICLEA OBSCURATA McLachl., is similar to type but darker, with spottings larger and more confluent. Habitat, Grinnell Land.

146b. ARGYNNIS CHARICLEA BOISDUVALLII Somm., similar to *A. chariclea*, but differs in having the central whitish band on hind wing below, divided into two bands that are broken into spots. Habitat, British Columbia, British America, Labrador, and northward. Occurs in June and July.

147. ARGYNNIS BUTLERII EDW.

BUTLER'S DUSKY BUTTERFLY.

Similar to *chariclea*, but with markings above much heavier, especially the central band. Beneath, there is but little yellow on apex of

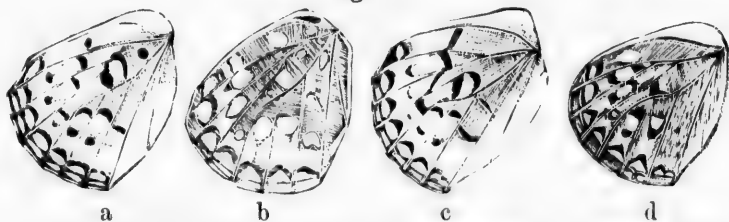
fore wings. Markings of hind wings, similar but overwashed with deep red, somewhat obscuring the markings. Habitat, Northwest America, Grinnell Land and Nova Zembla.

148. ARGYNNIS ALBERTA EDW.

ALBERTA BUTTERFLY.

Similar to *A. chariclea*, but differs in having the markings paler above. The third row of spots on both wings, is not continuous; the sub-marginal row of crescents wanting, they being represented by a small cluster of scales, only, smallest on the fore, and largest on the hind, wings. Beneath, the markings on fore wings are very pale, and the ground color of the hind wings is brown, without any reddish shade, and there are no white markings. The surface of the wings has a peculiar smoothness, giving them the appearance of having been greased. Expands, about 1.90. Habitat, Alberta, Canada. Occurs in June, at a considerable elevation.

Fig. 25.



Illustrating the genus *Argynnis*. a, upper side, hind wing, coronis; b, lower side, hind wing, halcyone; c, upper side same, edwardsi; d, same, callippe.

149. ARGYNNIS FREYA THUNB.

FREYA BUTTERFLY.

Similar to *A. c. boisduvallii*, but differs in the absence of the sub-marginal row of round spots on fore wings, and in having much less white on hind wing below, the most prominent spot of this color, being an arrow-shaped mark in the central cell. Expands, 1.35 to 1.60. Habitat, Labrador, Arctic America, Alaska, and Colorado.

149a. ARGYNNIS FREYA TARQUINUS Curt. is a more northern subspecies, smaller in size and darker in color, with the base of the wings, black. Habitat, Arctic America.

150. ARGYNNIS POLARIS BL

POLAR BUTTERFLY.

Similar to *A. freya*, but differs in having a row of minute crosses

on outer margin of hind wings below, Fig. 26, f. Habitat, Labrador, northward.

151. ARGYNNIS FRIGGA THUNB.

FRIGGA BUTTERFLY.

Size of chariclea but darker, at least one half of the hind wings obscured with dusky, and all of the markings are heavy. Beneath, there is a row of white spots on outer margin, the marginal border and sub-marginal crescents are absent, and the clear, sub-marginal interspace, as well as the wing outside of it, is overwashed with purplish. Habitat, Labrador, Arctic America, Alaska, and Colorado.

152. ARGYNNIS IMPROBA BUTLER.

DOUBTFUL ARGYNNIS.

Similar to *A. frigga*, but differs in being smaller and darker, with much heavier, suffused markings. Habitat, Arctic America.

153. ARGYNNIS BELLONA FAB.

MEADOW BUTTERFLY.

Color and size of *A. myrina*, but differs in having the two outer black borderings to both wings above, broken into spots, and having a somewhat different basal pattern of markings to hind wings, Fig., 28 b. Beneath, there is no silver bordering, this being replaced by a reddish purple bordering, in which the spottings above are repeated but in rufous, with bluish white centers. The central silver band and basal spots are replaced by yellowish rufous in a larger pattern. Expands, 1.55 to 1.80. Habitat, Northern United States, Colorado, British America, Ontario, and Quebec. Occurs from May to September.

154. ARGYNNIS EPITHORE BD.

DUSKY MEADOW BUTTERFLY.

Similar to *A. bellona* in general markings, but is not as brightly colored, and the basal fourth of fore, and basal half of hind, wings are so heavily obscured with dusky, as to nearly obliterate the markings, Fig. 28, c. Beneath, the basal half of hind wing, is rich purplish brown, with a central band of yellowish that contains a band of dark-ringed spots of whitish, more or less centered with rufous. Expands, 1.75 to 2.10. Habitat, California to Oregon, Nevada, and Alberta, Canada. Occurs in June and July.

154a. ARGYNNIS EPITHORE KREIMHILD Str. Similar to the type form, but differs in having little or no dark suffusion on the basal por-

tion of wings above, and in having much clearer yellow below Habitat, Utah and Arizona.

GENUS XVII.

EUPTOIETA. UPLAND BUTTERFLIES.

Size, medium. Colors, faded orange, banded and marked above with dull black. No silver below. Wings, large, not much pointed nor conspicuously angled. Antennae, long, but the club is not suddenly enlarged terminally, and it is not much flattened. TYPE, *E. CLAUDIA*. (Plate IV, 2.)

155. EUPTOIETA CLAUDIA CRAM.

PALE-RED BUTTERFLY.

Pale orange yellow above with dusky markings as follows; a rather wide border to outer margin of both wings, enclosing a row of yellowish spots; within this border is a row of round spots, then two rather zigzag bands, between which the ground color is very pale, while in the central cell of fore wing, is a dusky-ringed, pale spot, and within this is a short dash, directly beneath which, nearer the lower margin, is an arrow-shaped mark, and in central cell of hind wing a dash.

Beneath, the markings are repeated but much obscured with whitish, and there are lines of whitish on base of hind wing. Expands, 1.00 to 2.30. Habitat, from Maine and Massachusetts, where it is rare, south to the Gulf of Mexico, west through the Mississippi Valley, to Colorado, Arizona, and California; occasionally occurs in New Hampshire and Quebec. Found in Florida throughout the year, excepting, perhaps, in December and January; further north in mid-summer.

156. EUPTOIETA HEGESIA CRAM.

DOTTED BUTTERFLY.

Similar to *E. claudia*, but differs in being brighter, in having the markings above darker, in the outer zigzag band on fore wing being nearly, or quite, obsolete, the second band is broken into spots, and there is a third short, black dash at base of central cell, and also differs in the entire absence of any markings inside the row of spots on hind wings, Fig. 28, d. Beneath, the hind wings are marbled with whitish and dusky. Expands, 1.85 to 2.25. Habitat, West Indies, including Bahamas, rare-

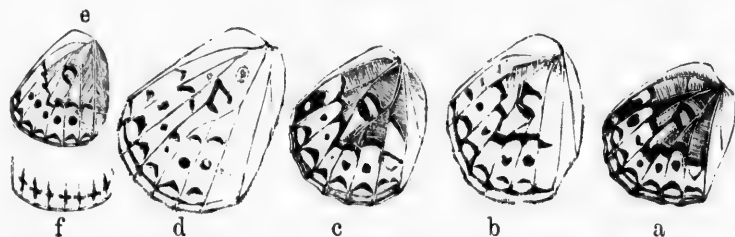
ly Florida, Southern California, and Texas. Occurs throughout the year.

GENUS XVIII.

MELITAEA. BLACK-CHECKERED BUTTERFLIES.

Size, small to medium. Colors, dark, often black, conspicuously marked in checker's of orange, reddish or yellow. Antennae, nearly as long as the body and terminating in a short, suddenly enlarged, flat club. Fore wings, long and pointed, hind wings comparatively short and without angles. TYPE, *M. PHAETON*. (Plate III, 3.)

Fig. 26.



Illustrating the genus *Argynnis*. a, upper side, hind wing, rupestris; b, same macaria; c, same incornata; d, same, semiramis; e, same, opis; f, outer margin same, polaris.

157. MELITAEA PHAETON DRU.

RED-BORDERED CHECKER.

Color, black, both wings bordered with spots of reddish orange, within which, on fore wings, are four rows of yellowish, and three on hind, the inner on both wings being indistinct. In central cell of fore wings, are four or five spots of reddish orange, and in central cell of hind, one. Beneath, markings repeated, larger, and spots in central cell of fore wings fused together with an additional spot of red below, near base, and some yellow dots. On hind wings, there are four clearly defined rows of yellowish spots, and within them, a row of reddish orange, with three more spots of same color in base, and five or more of yellowish. Expands, 1.75 to 2.10. Habitat, United States, east of the Rocky Mountains, excepting extreme southern portion, and northward to Ontario, Quebec, and Lake of the Woods. Locality distributed. Occurs from the middle of June, until the last of July.

158. MELITAEA COOPERI BEHR.

COOPER'S CHECKER.

More dusky above than *A. phaeton*, red bordered spots smaller, but yellowish ones larger, the four rows on fore, and three on hind wings occupy, at least, one half of the wing, and some of the spots are edged with reddish, but there are no prominent red spots in central cell of either wing one yellowish spot in base of fore, and three in that of hind, Fig. 28, c. Beneath, brick red: two rows of yellowish spots on fore wings, the outer of crescents and black-ringed, but not crossing wings, second with no rings, oval, and crossing wing, and in central cell are four black dashes. On hind wings are three rows of black-ringed spots and a spot in central cell, the two outer being confluent. Expands, 2.00 to 2.25. Habitat, Big Horn Mountains, Montana, Vancouver's Island, and Puget Sound, Washington Territory.

159. MELITAEA CHALCEDON DOUBL-HIEW.

CALIFORNIA CHECKER.

Resembles *M. cooperi*, but differs above in having the outer marginal red spots small, or occasionally wanting, the ground color blacker, and in the almost entire absence of any red on other portions of wing in the female, and in the male, in its being confined to two dots near end of central cell of fore wings, and two others between second and third row of spots. Beneath, the yellow of the first and second row of spots on hind wing, encroaches upon the red interspace, and the spots at base of wing are larger and more confluent, Fig. 29, b. Expands, 2.00 to 2.20. Habitat, California.

159a. MELITAEA CHALCEDON DWINELLEI H. EDW. Differs from the type, in being much suffused with red above, nearly obscuring the yellowish spots, and there is no sub-marginal row of whitish spots. Beneath, the yellowish spots are much larger, and the red spots are much more broadly edged with black. Habitat, Mt. Shasta, California.

160. MELITAEA COLON EDW.

COLON CHECKER.

Similar to *M. chalcedon* but differs in having no red in the central cell of fore wing above, in having the second row of spots on same wing, mixed red and yellow, and the second row of spots on hind wings beneath red with no yellow, and forming a more continuous bar. Expands, 2.00 to 2.30. Habitat, Columbia River, Western Washington Territory and Oregon.

161. *MELITAEA ANICIA* DOUBL-HIEW.

WHITE-SPOTTED CHECKER.

Similar to *M. baroni* but differs in having the white spottings above much more extended, nearly obliterating the red, and the fore wings are narrower and much more pointed. Expands, 1.50 to 1.80. Habitat, California, Nevada, New Mexico, Colorado, and Montana.

162. *MELITAEA NUBIGENA* BEHR.

CLOUD CHECKER.

Similar to *M. anicia* in size, form, and general coloration, but differs in having the club of the antennae wholly black, not red-tipped, the band of spots in the pallid interspace, part orange, and following the band of crescents. Habitat, California, Nevada, New Mexico, Colorado, and Montana.

162a *MELITAEA NUBIGENA WHEELERI* H. EDW. Similar to type but pale red on ground color of upper surface; base of wings, white, and there is more black beneath. Habitat, Nevada.

163. *MELITAEA QUINO* BEHR.

QUINO CHECKER.

Differs from *M. chalcidon*, in being much brighter above, but the under side of the hind wing is paler and there are six distinct spots, only, in the central band; the club of the antennae is black, not red. Expands, 1.60 to 1.80. Habitat, Mendocino, California.

164. *MELITAEA BARONI* H. EDW.

BARON'S CHECKER.

Size, smaller than *M. cooperi* but about the same ground color; differs in markings, in having the first row of yellowish spots on fore wings reduced to a narrow, nearly continuous, line, the third row of spots on fore, and second on hind, wings, red, with two red spots in central cell of fore wing, about as in *phaeton*, and having a whitish bar between them. Beneath, there is a white, isolated line of spots in the middle of the reddish interspace between first and second row of whitish spots. Fig. 30, b. Expands, 1.50 to 1.80. Habitat, Northern California. Occurs in May, June, and July.

165. *MELITAEA RUBICUNDA* H. EDW.

RED CHECKER.

Above, black, with rows of spots as follows; fore wing, first row,

(marginal) second, and third, yellow: fourth, red outwardly, yellow, inwardly; three spots at end of central cell, yellow; four in cell, one red and three yellow, and three, red, beneath the cell. Hind wings; marginal row, red, second, yellow, third, red, fourth, yellow; two dashes in cell and five or six basal spots, yellow. Beneath, red on fore wings, with two rows of yellow spots, the first, black-edged outwardly, and the second, inwardly; a spot outside cell, yellow, and a yellow spot at end; two yellow ones within the cell, all black-edged. Hind wings, red; a row of sub-marginal crescents, followed inwardly by a black line, then six yellow spots, nine or ten basal, and two on lower margin. Expands, 1.75 to 2.00. Habitat, Northern California.

166. MELITAEAE EDITIA Bd.

EDITH'S CHECKER.

Similar to *M. baroni* but differs above in having the spots of the second red band on hind wing, slightly pupiled with yellow; and the spots of the red band of same wing beneath, are also centered with yellow. Expands, 1.30 to 1.80. Habitat, Southern California.

Fig. 27.



Illustrating genus *Argynnis*; a, upper side, hind wing, *biseotti*; b, same, *eurynome*; c, same, *egleis*; d, same, *myrina*; e, same, *tricularis*; f, same, enlarged, *helena*.

167. MELITAEAE HELVIA Scud.

SCUDDER'S CHECKER.

Allied to *M. anicia*, but differs in being darker above. The marginal spots are reddish, the second and third rows on fore wing are whitish, there are two whitish spots outside the central cell, and three spots in it, the outer reddish, the middle mixed white and red, and the inner whitish. There are four rows of spots on outer half of hind wings, close together, first reddish, second whitish, third reddish, and the inner is dusky and whitish. Brownish red beneath, deepest on hind wings. Expands, 1.50. Habitat, Ramparts, Youcon River, Alaska.

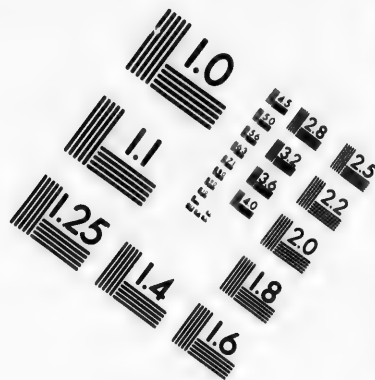
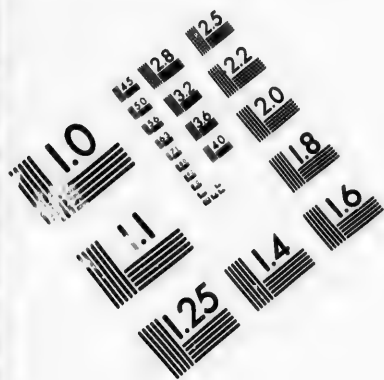
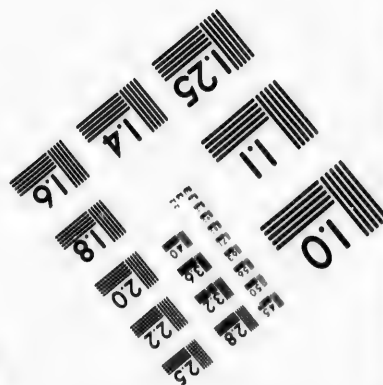
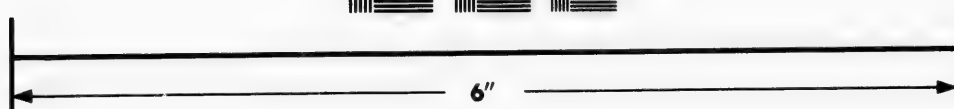
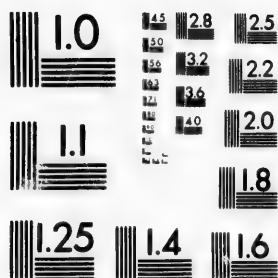
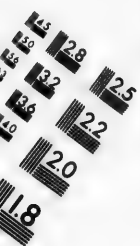


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168. *MELITAEA STEROPE* EDW.

OREGON CHECKER.

Blackish brown above with light markings as follows; above, fore wings with two rows of small spots near outer margin, a third row, divided near upper margin, two spots in central cell, and one below it. Hind wings, with a marginal row of larger crescents, then a second row of dots, and a third of elongated spots. Beneath, on fore wings, markings repeated but more diffused; hind wings, with the marginal crescents but they are black-edged on both sides, and within this row, is a black band that contains a series of yellowish dots, each white-pulpiled; base of wings, yellowish, with a band of six white spots. Expands, 1.80 to 1.90. Habitat, Oregon.

169. *MELITAEA ACASTUS* EDW.

ACASTUS CHECKER.

Similar to *M. palla* but differs in being paler above, and in having the spots and bands of the lower surface of hind wings, so greatly enlarged as to occupy nearly the whole space. Expands, 1.50 to 1.90. Habitat, Nevada, Utah, and Montana.

170. *MELITAEA PALLA* Bd.

NORTHERN CHECKER.

Size and form of *M. harrisii*, but differs in being brighter in color above, in having the outer black border of fore wings broken by two rows of reddish spots, Fig. 29, e, and in the absence of any decided ochereous spot in central cell, on fore wing beneath. Expands, 1.75 to 2.00. Habitat, California to Washington Territory, Nevada, Montana; Alberta, Canada, and Crow's Nest, British America. Occurs in June and July.

171. *MELITAEA WHITNEYI* BEHR.

WHITNEY'S CHECKER.

Similar to *M. palla* in size and form, duller in color above, and with the dark lines much thinner and more regular, and the orange spots of the sub-marginal band of hind wings beneath, are without white centers. Habitat, California and Nevada.

172. *MELITAEA HOFFMANNI* BEHR.

HOFFMANN'S CHECKER.

Similar to *M. palla* but differs in being yellower above, with more black lines, especially on the center of fore wings; the spots forming sub-

marginal band on hind wings below, are rounded, not crescent-shape. Expands, 1.50 to 1.90. Habitat, California, Nevada, Oregon, Colorado, and Montana.

173. *MELITAEA GABBII* BEHR.

GABB'S CHECKER.

Similar to *M. palla* above, but the spots on hind wings below are more or less frosted with silver. Expands, 1.55 to 1.90. Habitat, Southern California, Utah, and Arizona.

174. *MELITAEA HARRISII* SCUD.

HARRIS' BUTTERFLY.

Above, rather dull reddish orange, with dark brown markings as follows, and occupying rather more than one half the surface. There is a broad border to both wings, one on hind containing a row of not very clearly defined crescents, within this is a narrower band, followed, on fore wings, by a wider band, within which, on base of wing, is a somewhat intricate pattern, Fig. 29, f, and the base of hind wings is wholly dark, excepting two reddish spots in central cell. Beneath, reddish orange, with a sub-marginal row of whitish crescents, within which, on fore wing, is a row of dots, two wider bands of buff, and two spots in central cell. On hind wing, within crescents, is a confluent, triple row of spots, and about five spots on basal half of wings, all spots on both wings being black-encircled. Expands, 1.30 to 1.40. Habitat, Northern New England to New York, Illinois, Michigan, Wisconsin, Ontario, and Quebec. Rare in Eastern Mass.

175. *MELITAEA ULRICA* EDW.

ULRICA CHECKER.

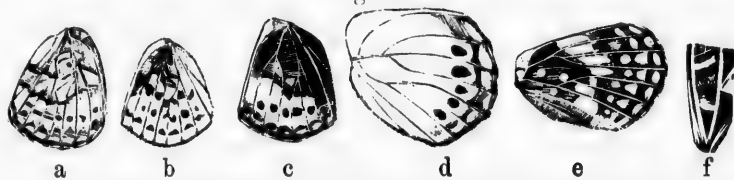
Above, similar to *M. vesta* in spottings and markings. Beneath, the outer fourth of fore wings is black, crossed by a sub-marginal band of confluent, yellowish orange spots, beyond which is a series of white dots. Second row of spots seen above, repeated but the spots within this are so greatly enlarged as to occupy the entire basal area. Hind wings, with a marginal band of yellowish, then a series of large white spots, then a black area, within which is a row of yellowish red spots, not crossing the wing. Across middle of wing is a row of white dots and a continuous white band. Basal area, yellowish red, with a white spot in central cell, a white bar near base, and one at base. Expands, .85 to .95. Habitat, South-western Texas.

176. MELITAEA DYMAS EDW.

DYMAS CHECKER.

Brownish black above with the following reddish orange markings; on fore wings, is a sub-marginal band of rounded spots, imperfect on upper half, then a band of spots, and five spots in central cell, several spots at end of cell and below it; apex, white. Hind wings, with a central band of spots, within which is a band of black, with the basal area reddish. In central cell is a sub-oval, black spot with a reddish stripe in the middle. Beneath, on fore wings, a band of white is followed by a row of crescents upon a black ground. Inside this band, the wing is reddish orange, with four black, transverse lines in central cell, and an indistinct line at end. Hind wings have a row of dull white spots on a black ground, then a reddish orange band, followed by a broad white band that is cut beyond the middle by a black stripe, from outer to inner margin. Base and central cell, orange, with a triangular, black-edged white spot in cell, and a black-edged, white, transverse line. Expands, .95 to 1.00. Habitat, Southwestern Texas.

FIG. 28



a, lower side, hind wing, *Argynnis montinus*; b, same, *A. bellona*; c, same, *A. epithore*; d, same wing, upper side, *Euptoleta hegesia*, e, same wing, *Melitaea cooperi*; f, base of wing, upper side, same species.

177. MELITAEA PERSE EDW.

ARIZONA CHECKER.

Similar in form to *M. dymas*, orange yellow above, with outer margin of both wings broadly edged with black, on which is a row of orange yellow spots, followed by a black line, and from this to base, is an intricate pattern of lines. Beneath, with markings repeated but indistinctly, on fore wings, and upper margin white. Hind wings, with upper margin also white, and there is a row of white, sub-marginal crescents, then a series of orange spots on a whitish ground, within which is a narrow buff band, followed by a white band. Basal area, orange with a black-edged white spot in central cell, and a white band on upper margin. Expands, 1.00 to 1.10. Habitat, Arizona.

178. MELITAEA CHARA EDW.

CHARA CHECKER.

Similar to *M. perse* above, but differs in having the outer margin of hind wings beneath, black, not buff nor orange, and the spots of outer row are rounded or crescent-shaped. Expands, 1.15 to 1.40. Habitat, Southern Arizona.

179. MELITAEA LEANIRA Bd.

WHITE-BANDED CHECKER.

Above, dark brown with a reddish marginal band of spots on fore wings, then a row of yellow dots, followed by an irregular band of larger spots and two yellow spots, and a bar in the central cell; beneath the cell is a dot and a heart-shaped spot. On hind wings are two rows of spots near the middle of the wing, the outer dots and the inner larger. In the cell are two spots, the outer a crescent and the inner a dot. Beneath, reddish on fore wings margined with buff, within which is a black band, and inside this are two rows of white. Hind wings buff fringed with black, and with a narrow, sub-marginal band of black, followed by one of the same color, broader, and containing a row of white spots, Fig. 30, a, and there is an intricate pattern in black, at base of wing. Antennae, wholly reddish. Expands, 1.25 to 1.75. Habitat, California, Arizona, Nevada, Montana and Garnett Rancho, British America.

180. MELITAEA ALMA STR.

STRECKER'S CHECKER.

Both wings above margined with black, within which is a row of spots on fore, and a band on hind, of orange, within this, is a black band, indistinct on hind wings, followed by a narrow, yellow band, then a second band of orange, then a second yellow band, then an irregular band of black on fore wings, and between this and the outer black band, is a black spot on upper margin of both wings; in central cell of fore wings is a black band, and the base of hind wing is black, containing two yellow spots in central cell. Beneath, yellowish, with the marginal black band to both wings, and the sub-marginal band on fore wings, and between these two bands on fore wings, near the middle of the border, is a spot of orange, and on these wings, two bands of orange, the outer of which is divided for its upper half, forming a Y. Hind wings crossed by a sub-marginal band of black, containing a row of white spots, Fig. 30, b, similar to that seen in *M. leanira*, but larger than in that species. Expands 1.30. Habitat, Arizona and Southern Utah.

181. *MELITAEA FULVIA* Edw.

YELLOW CHECKER.

Allied to *M. leanira*, but differs in having the brown above dusted with yellowish. There is a series of brownish orange spots, crossing both wings, preceded by a black band, those on fore wing being replaced by yellow, and at apex, by a black line, and within this is a series of small yellow spots, and a series at end of central cell, larger, and on hind wings, elongated. Inside cell and below it, are three small, yellow spots. Beneath, on fore wings, reddish orange, with the markings above showing indistinctly. Hind wings, yellowish buff with veins broadly edged with buff, at end of central cell is a black line, and within the cell, a V-shaped mark of black, point toward the base, and a black stripe in center of wing. Expands, 1.50. Habitat, Western Texas and Colorado.

182. *MELITAEA THEKLA* Edw.

THEKLA CHECKER.

Pale ochereous above, fore wings narrowly margined with black, with a white point near upper border. There is a double, sub-marginal row of irregular sized spots; at end of central cell, is a slight band of orange edged with black; upper margin and extreme base of wings, black. Hind wings, with black border and outer margin wider, enclosing a row of obscure dots and streaks. Two irregular, black lines cross the wing, which with the black veins, divide this portion of the wing into checkers. Within this, the basal area is ochereous, marked with only a black line in the central cell. Beneath, deeper in color than above, with similar markings, but the spots are larger, and there is a white bar in the central cell of hind wing; and at base, four long, white spots in a black ground. Expands, 1.30 to 1.50. Habitat, Southern California and Arizona.

183. *MELITAEA BOLLII* Edw.

BOLL'S CHECKER.

Habitat, South-western Texas and Arizona. NOTE, for description of this species, and that of others of this genus, see Appendix.

184. *MELITAEA MINUTA* Edw.

LITTLE CHECKER.

Above, dull yellowish orange, both wings margined with black and crossed by eight black bars on fore, and five on hind, wings, and there is a lighter central bar. Beneath, paler on fore wings, with outer margin whitish, inner bars repeated, but narrower. Hind wings, crossed by

two bars of whitish spots, black-edged, which in the central cell, are somewhat C-shaped, inverted, Fig. 30, f. Expands, 1.40. Habitat, Colorado, Arizona, and New Mexico.

185. MELITAEA. ARACHNE EDW.

ARACHNE CHECKER.

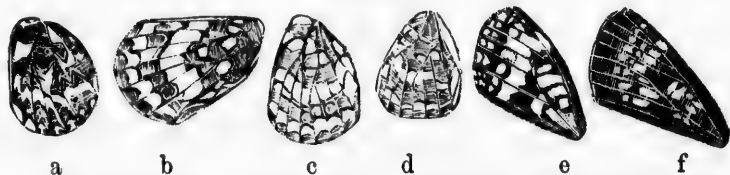
Similar to *M. minuta* in general coloration but differs in having two bars of reddish spots, on outer margin of fore wing above, instead of one divided on upper half. There are three bars of reddish, in the central cell, not four. On hind wings beneath, rather more yellowish. Expands, 1.60. Habitat, Colorado, Arizona, and Western Texas.

186. MELITAEA NYMPHA EDW.

NYMPH CHECKER.

Black above, both wings with a sub-marginal row of small crescents, inside which is a row of large, reddish orange spots, slightly white-centered on fore wings above; within this, a third row crossing middle of wings, is pure white on hind pair, yellowish on fore. At end of central cell on fore wings, is a row of three reddish spots; in the cell near end, a pair of yellowish spots, and in middle, a third, larger and reddish. In central cell of hind wings, is a large reddish patch. Beneath, marked much as in *M. minuta* but differs in having no black dots in the clear, continuous, reddish-orange, sub-marginal band on hind wings. Expands 1.30 to 1.50. Habitat, Southern Arizona.

Fig. 29.



a, lower side, hind wing, *Argynnis chariclea*; b, same, *Melitaea chalcodon*; c, same, *M. nubigena*; d, same, *M. baroni*; e, fore wing, upper side, *M. palla*; f, same, *M. harrisi*.

GENUS XIX.

PHYCIODES. THE LITTLE CHECKERS.

Differs from the preceding genus, in having the fore wings rather more rounded at apex, and the colors above are orange with spottings and bandings of black, with occasional white spottings. TYPE, *P. THAROS*. (Plate IV, 4.)

187. PHYCIODES NYCTEIS DOUBL.-HEW.

SILVER CRESCENT.

Similar in general markings and color above to *P. tharos* but is larger, the eight bands on the hind wings beneath are silvery, and mainly confined to two, a basal and a central, the outer row of crescents being represented by one or two at upper border of wing, and a large silver crescent near the middle of the margin, Fig. 30, c. Expands, 1.70 to 1.80. Habitat, Maine to North Carolina, and westward to the Mississippi valley; (rare in Massachusetts) Ontario, and Quebec. Occurs in June and July.

188. PHYCIODES CARLOTA REAK.

CARLOTA CHECKER.

Similar to *P. nycteis* above, but with all the markings broadened, nearly obscuring the reddish orange; beneath, fore wings have more black through middle, and the hind wings are rather darker brown, with only two yellowish spots in the central cell. Silvery markings, as in *nycteis*. Habitat, Southern and Western States, Rocky Mountains, Montana to Oregon, and rarely in Western Virginia.

189. PHYCIODES VESTA EDW.

VESTA CHECKER.

Smaller than *P. tharos*, about same color above, but there are two rows of oval light spots, crossing outer half of fore wings, Fig. 31, f, and the lower surface is more finely banded. There is a summer form in which the markings are heavier. Expands, .90 to 1.10. Habitat, Texas.

190. PHYCIODES PHAON EDW.

SOUTHERN CHECKER.

Similar to *P. tharos* but differs in having a whitish band crossing the fore wings, widest above, but showing on both surfaces, Fig. 30, d. Beneath, the hind wings are paler, with the dark markings clearer, bolder, and darker. There is a dark, summer form. Expands, 1.00 to 1.30. Habitat, Gulf States, Texas, and occasionally Kansas.

191. PHYCIODES THAROS DRU.

LITTLE BLACK-BORDERED BUTTERFLY.

Plate IV, 4.

Above, yellowish orange, both wings bordered all around, excepting on lower margin of hind, with black, widest on outer margin, where is enclosed, on fore wings, a single crescent near middle, and on both wings

a connected series of more or less distinct crescents. The middle of fore wing is crossed by a band of black, more or less broken in the middle; inside of the outer band, on hind wings, is a series of black spots, each surrounded by a more or less distinct ring of dusky that sometimes unite to form a band on the inside. There is an irregular black ring in central cell of both wings, and an intricate pattern of rings at base of both wings. Beneath, paler, the black margin absent, but the sub-marginal crescents show as light spots in dark edges; there are two broken, black bars crossing the fore wing, usually indicated by four spots on the upper and lower margins. Hind wings, pale ochreous with a more or less distinct marginal band of brownish, that becomes enlarged in the middle of the wing, and encloses a purplish crescent; a more or less distinct central band of brownish, between which and the outer margin, is a row of small brown dots; the rings at base of both wings show palely.

MORPHEUS is a summer form in which the markings above are heavier, and the brown below intensified and extended.

There are many variations from the type in this species, occurring throughout its wide range. Examples from Canada, while they are nearly melanotic above, so great is the suffusion of the black, show a pale central band on fore wings and are much paler below, sometimes very much so, packardii Saund. being evidently an extreme case of this suffusion, with a very pale under surface. Expands, 1.30 to 1.70. Habitat, United States, west to the Rocky Mountains, north to British America, west to the Pacific Ocean, east to the Atlantic, including Anticosti. Winter form in New England occurs from May to June, summer, from July to September; in Florida, they are nearly continuous throughout the year.

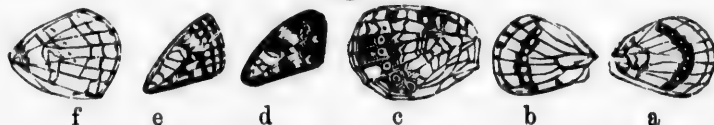
192. PHYCIODES BATESII REAK.

BATES' CHECKER.

Similar to *P. tharos* but differs in having the black markings above very much extended, so that the orange is reduced on fore wings, to two bands of spots, crossing outer portion of wing; three or four short bars in central cell, a streak on lower margin, and a spot near middle of outer margin. The hind wings are also crossed by two orange bars, the outer containing the row of spots, and the sub-marginal crescents are more or less distinctly visible. There are two spots in the central cell, the inner small and semi-circled by the outer. Beneath, the central bar crosses the wing, with only a short bar between it and the apex, the lower bar being absent as in *P. phaon*; and there are three black crescents on

outer margin. Hind wings lack the brownish markings, and the distinct, purplish, single, crescent is very pale, with all the markings showing faintly. Expands, 1.65 to 2.25. Habitat, West Virginia, Maryland, and from New York to Ohio. Occurs with *P. tharos*.

Fig. 30.



a, hind wing, beneath, *M. leanira*; b, same, *M. alma*; c, same, *M. minuta*; d, same, *Phyciodes nyoctels*; e, fore wing, upper side, *P. phaon*; f, same, *P. picta*.

193. PHYCIODES PRATENSIS BEHR.

MEADOW CHECKER.

Black above predominates as in *P. batesii*, but differs from this species, in having a series of black spots in the sub-marginal interspace of both surfaces of fore wings. Beneath, more like *tharos* but with paler spottings, and the marginal series of crescents on hind wings, are very pale and surrounded with brownish. Expands, 1.20 to 1.30. Habitat, California, Oregon and Arizona.

194. PHYCIODES ORSEIS EDW.

ORSEIS CHECKER.

Quite similar to *P. phaon* but differs in having a row of black dots within the black, marginal band. Hind wings, have the whitish, sub-marginal crescents perfect, and each one is accompanied on the inside by a black spot, and the second, narrow, black band is more complete. Beneath, on fore wings, pale ochreous, with a small, brown patch on middle of upper margin; outer margin of both wings, yellowish, double on middle of fore wings, and on whole of hind, where it encloses a large, pale crescent. Remainder of fore wings, mottled with yellowish and reddish. Hind wings, with an intricate pattern of lines, from the base to middle, bounding which is a wavy line, and outside of this, is a pale dusky stripe and a row of brown dots. Expands 1.60 to 1.90. Habitat, California, Washington Territory, and Oregon.

195. PHYCIODES CAMILLUS EDW.

OBSCURED CHECKER.

Similar to *P. tharos* in the darkest phase, but even more obscured above, with the black. The reddish, marginal crescents show indistinctly

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EXPLANATION OF FIGURES ON PLATE V.

1. *Synchlœ adjutrix*. 2. *Grapta comma*. 3. *Vanessa milbertii*. 4. *Cystineura amymone*. 5. *Pyrameis cardui*.

excepting the large, central one. The spots of second band are greatly reduced, and all isolated, as are, in a great measure, those of the central band, but these are paler in coloration than the others. The base of the wing is black, there is a pale band across central cell, and two or three small, reddish spots in the cell on both wings. Beneath, paler yellow, with the darker markings above showing in orange, and the lighter in yellowish. There is an oblique, black, line crossing the end of central cell to middle of wing, a small, black patch near apex, a large patch near middle of lower margin, one at outer lower angle, and a small one between the two. Hind wings, clear yellow, with a pattern of pale yellowish red lines at base, a reddish line crossing middle of wing, and a rusty patch at its end on the upper border. Also a large sub-triangular patch of same color on middle of outer margin. There is a series of marginal crescents on both wings, of whitish, the central of which are enlarged and yellow, or sometimes silvered, this frosting occasionally extending to two or three other adjacent ones. Expands, 1.30 to 1.40. Habitat, Colorado, Montana, and Kansas.

195a. *PHYCIODES CAMILLUS PALLIDUS* Edw. is a pale form, showing all of the markings of the type, but with the black above less extended.

195b. *PHYCIODES CAMILLUS MATA* Reak. is exceedingly pale above, insomuch so, that the dark markings are scarcely perceptible. Below, it is almost uniform pale yellow, with the dark markings showing faintly in orange, and the black spottings nearly, or quite, obsolete. Habitat, Colorado, Montana, Texas, and Kansas.

NOTE. For further description and notes on genus *Phyciodes*, see Appendix.

196. *PHYCIODES MYLITTA* Edw.

MYLITTA CHECKER.

Most like *P. phaon* above, but differs in having the crescents on the marginal dark band yellowish especially the central of fore wings, and the band across centre of fore wing is orange, not whitish. Beneath, the hind wings are much clouded with brown at base, and on outer margin, leaving a whitish, rufous-edged band crossing the wing. The large central crescent is pointed, nearly arrow-shaped, and white, two near upper and lower border, yellowish, and the remainder dark brown. Near base of wing are several whitish, rufous-ringed spots. Expands 1.20 to 1.50. Habitat, California, Washington Territory, Arizona, Colorado, and Utah.

197. PHYCIODES MONTANA BEHR.

SMALL MOUNTAIN CHECKER.

Similar to *P. tharos* in general markings but differs above on fore wings, in having the inner black bands rather pale, and there are no sub-marginal crescents. Beneath, on hind wing, the crescents are present and the large central one is silvered. Expands, 1.30 to 1.50. Habitat, California and Lake Tahoe, Nevada.

198. PHYCIODES PICTA EDW.

PICTURED CHECKER.

Similar to *P. phaon* but differs in having the marginal border of wing above, widened as far as the central, whitish band, and inclosing two rows of round, whitish spots, Fig. 30, e, and there is a black-edged whitish bar in central cell. Beneath, the apex of fore wing is buff, and the hind wing is buff, with only slight indications of markings. Expands, 1.00 to 1.15. Habitat, Colorado, New Mexico, Arizona, and Nebraska.

GENUS XX. ERESIA. SPOTTED BUTTERFLIES.

Differs from *Phyciodes*, mainly in form of fore wings, which are greatly elongated, and in the preponderance of black, relieved only by a rather limited amount of bright colors, reds, yellows, and orange. Size, small, and some of the species resemble little *Heliconians*. TYPE, *E. FRISIA*. (Plate IV, 5.)

199. ERESIA FRISIA POEY.

FLORIDA SPOTTED BUTTERFLY.

Reddish orange above with a broad, black border to both wings, that on hind, containing a row of connected crescents, and within it, on fore wings, are three black bands, the first connected with the second below the middle of the wing, and the third and fourth connected from the middle vein to the upper margin; these last two bands continuing very faintly across the hind wings, and then, on both wings, are four undulating, more or less distinct, lines, connected in places by cross lines. The interspaces between the bands are paler than the remaining ground color. Beneath, the basal half of wing is reddish orange, with four or five large, buffish spots, the outer half brown, with the border whitish,

and two whitish patches. Hind wings, with a buff border on outer third, and there is a sub-terminal row of buff crescents, in a brown patch followed by a series of arrow-shaped marks in brown, and the center of the base is lined with reddish. Expands, 1.40 to 1.50. Habitat, Cuba and Key West, Florida.

200. ERESIA TEXANA Edw.

TEXAS SPOTTED BUTTERFLY.

Blackish brown above: wings mottled with reddish brown at base of both wings, and sprinkled with white dots that form, on fore wings, an interrupted, sub-marginal band of four spots across end of cell, two in cell and two below it. Hind wings have a decided row of white spots across the middle, and a sub-marginal row of faintly defined crescents. Beneath, on fore wings, ochery yellow at base, then dark brown, becoming paler on apex and outer margin. There is a sub-marginal row of crescents, and the white spots seen above are larger. Hind wings have the outer margin broadly edged with brownish that contains a sub-marginal row of whitish crescents, the third from the bottom being largest; a white band crosses the middle of the wing, and within this, the base is buff and white with an intricate pattern of dark lines. Expands, 1.50. Habitat, Texas and Nebraska.

201. ERESIA PUNCTATA Edw.

PUNCTURED BUTTERFLY.

Above, reddish orange with a patch on upper border, near apex, of yellow, and a large, yellow spot near this, with a smaller spot at its upper corner; inside of this, a third spot near the end of the central cell, a fourth below this, a fifth below this, in a line with a bent line that crosses the cell, all yellow. Hind wings have a double series of sub-marginal crescents, preceded by a yellow streak extending from the lower margin to middle of wing. A broad, yellow, central band, narrowest below, crosses the wing. There are indistinct, reddish marks at base, and a white spot in central cell. Expands, 1.20. Habitat, Arizona and New Mexico.

GENUS XXI.

SYNCHLOE. PATCHED BUTTERFLIES.

Size, medium. Colors, dark, brown or black. with prominent patches of brilliant colors, orange, yellow or

scarlet. Fore wings, elongated and rather pointed. Hind wings, short and rounded. Antennae, about two-thirds as long as body, terminating in a rounded club. TYPE, S. JANNAIS. (Plate, V, 1.)

202. SYNCHLOE JANNAIS DRU.

CRIMSON-PATCHED BUTTERFLY.

Black above, with a sub-marginal row of white dots on fore wings, and one on upper margin of hind; four near end of central cell, three within it near middle, and two below it, one near base of wing and one in the middle. Hind wings, with a large, central patch of crimson. Beneath, also black, with a double series of sub-marginal white dots; three dots at end of cell, three within it in a line parallel with the veins, and two below the cell. Two enlarged, sub-marginal, white spots near center of outer border of hind wing, and within this, a row of white dots, the upper and lowest of which are the largest. Central spot, with the inner two thirds, yellow, inclosing four black spots near its base. Expands, 2.25. Habitat, Washita Valley, Texas and southward to Mexico and Central America.

203. SYNCHLOE MEDIATRIX FELD.

MEDIATOR BUTTERFLY.

Above, black, with a band of pale reddish yellow, crossing center of both wings; two spots at end of cell on fore wing, and one within it, white. There is a narrow band of faintly defined spots, and beside it, are a number of small dots. There is a double row of small white spots of equal size on outer border. Hind wings have three equal bands of sub-marginal, reddish spots, often confluent on outer portion, within which are white dots. Beneath, with markings more diluted on fore wings, spotted about equally with yellow and white, and on hind wings, most of the spots are white. Habitat, Texas and southward.

204. SYNCHLOE ADJUTRIX SCUD.

ALLIED BUTTERFLY.

Closely allied to *S. mediatrice*, differing mainly from it in having the central band of yellow on hind wings, broadest in the middle. Expands, 1.80. Habitat, Texas.

205. SYNCHLOE ERODYLE BATES.

BATES' PATCHED BUTTERFLY.

Black above, fore wings with seven white spots of various sizes, arranged in a rude circle at end of cell, and a curved row of six similar spots, but of more uniform size, between these and the outer margin, and two near base. Hind wings, with a sub-basal, yellow patch, divided by the black veins and by two small, black spots entering within the central cell. There are two red spots near outer, lower angle. Beneath, similar, but spots at apex of fore wings are yellow, and a vermillion streak on upper margin of base, and the yellow patch at base of hind wing, are more divided by the black spots, and there are additional red spots in center of wing, and a sub-marginal row of yellow; one yellow spot between the two pairs of red; two above the middle pair, and a row of yellow spots between these and the yellow base. Expands, 2.00. Habitat, Texas and southward.

206. SYNCHLOE CROCALE EDW.

WHITE-BANDED BUTTERFLY.

Black above, fringed with white, interrupted at veins. A sub-marginal row of dots on fore wings, four large spots on end of central cell, a dot outside the lowest, two dots below it, and a spot near middle of lower border, with a dot above it, all white. There is a band of seven spots crossing middle of hind wings, Fig. 31, i. Beneath, also black, spots on fore wings repeated, with an additional marginal row of crescents and a spot within the larger one on lower border, and basal portion of upper border, reddish. Band on middle of hind wing enlarged and yellowish, and the spots are confluent; spot outside of band, near border, and a basal line yellowish, and a submarginal band of yellowish crescents. Female with the spot on lower border of hind wing reddish, and there are two rather indistinct bars of reddish between the basal and central bands. Habitat, Arizona.

GENUS XXII. CYSTINEURA.

SHORT-BODIED BUTTERFLIES.

Size, small. Colors, pale reddish or yellowish, without prominent markings. Antennae, not half as long as fore wing. Fore wings, elongated and triangular. Hind wings, short and triangular. TYPE, C. AMYNONE. (Plate V, 4.)

207. CYSTINEURA AMYMONE MEN.

AMYMONE BUTTERFLY.

White above on fore wings, dusky at base and along upper and outer margin, widest on the latter, where are inclosed some spots of pale orange. Hind wings, pale orange fringed with whitish, within which is a black band, then a row of pale bluish crescents. There is a white band crossing center of wing, widest above; within this, is another wide band; base of wing, dusky. Beneath, the dusky markings of fore wings are replaced by orange, and the hind wings are wholly orange, excepting that the white and bluish markings above are repeated, and there is white between the two bands. Habitat, Texas and southward. Expands, 1.60.

GENUS XXIII. GRAPTA. SILVER COMMAS.

Size, medium to large. Colors, reddish or orange above, prominently marked with black; duller below, with a silvery, C-shaped mark in middle of hind wings. Wings, large, notched, and the hind ones are tailed. Antennae, shorter than the short body, with the club flattened and suddenly enlarged. Hybernates as a perfect insect. TYPE, G. COMMA. (Plate V, 2.)

208. GRAPTA INTERROGATIONIS FAB.

SEMICOLON BUTTERFLY.

Size, larger than G. comma; color above, brighter, border of fore wings not as black as the other markings, broad, and not as clearly defined, there are seven black spots, instead of six, Fig. 31, h, and the silver C on lower side of hind wing is divided, forming a more or less distinct; Fig. 31, hh. UMBROSA, Lint., is the summer form, with the hind wings much obscured with dusky. Expands, 2.00 to 2.75. Habitat, United States, excepting Pacific States, also Ontario, Quebec, and Nova Scotia. Occurs in June, August, and September.

209. GRAPTA COMMA HARR.

COMMA BUTTERFLY.

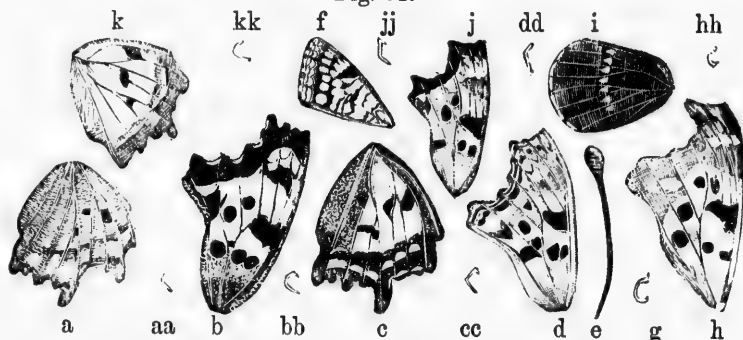
Plate V, 2.

Above, reddish orange, with outer margin of both wings bordered with black, well defined on inner edge of fore wings; within this, at apex, is a triangular patch, outside the point of which, are two black dots, encircled with a yellowish bar across end of central cell, and two spots

within it, three spots in wing, below cell, and a triangle in lower, outer angle, all black. Hind wings have the marginal border not well defined, being dusky within, and inclosing a row of yellowish spots, clearer on basal half, and enclosing about three black spots. Beneath, banded and lined with yellowish, dusky, whitish, and brownish, the general effect being brownish. The silver C is entire, Fig. 31, g.

DRYAS is the summer form, with the hind wings much obscured with dusky above, and with a yellowish overwashing. A variety has the lower side of wings, grayish, much as in *C. progne*, but the C is always wider than in that species. Expands, 1.42 to 2.20. Habitat, Eastern, Middle, and North-western States, also North Carolina and Tennessee, from Kansas to Texas, Ontario, Quebec, and Nova Scotia. Occurs in June, August, and September.

Fig. 31.



a, upper side, hind wing, *Grapta zephyrus*; aa, C of same species; (C's occur on lower side of hind wings.) b, upper side, fore wing, *G. faunus*; bb, C of same species; c, hind wing, upper side, *G. rusticus*; cc, C of same species; d, fore wing, upper side, *G. satyrus*; dd, C of same species; e, antennae (enlarged) *G. interrogationis*; h, fore wing, upper side, same species; hh, C of same species; g, C of *G. comma*; j, fore wing, upper side, *G. hylas*; jj, C of same species; k, hind wing, upper side, *G. gracilis*; kk, C of same species; f, upper side, fore wing, *Phyciodes vesta*; i, hind wing, upper side, *Synchlœ crecale*.

210. GRAPTA SATYRUS EDW.

SATYRID BUTTERFLY.

About the size of *G. comma* much brighter orange, even than *interrogationis*; the marginal border is narrow, often being represented by a series of scarcely confluent spots, there are six spots on wing, but the lowest, is larger than in *G. comma*. Hind wings, have the sub-marginal border, so detached, as scarcely to inclose any spots. Beneath, much as in *comma*, but the C. is bent in the middle similar to that in *progne* but is not quite as slight as in that species. Fig. 31, dd.

MARSYAS, is a dimorphic form in which the border is as distinct and wide as in comma, then the upper surface bears a striking resemblance to that species, differing only in greater brilliancy of color which shows more clearly on hind wings. Beneath, the colors are much obscured with brown, but the C is quite like that of comma. A variety is much suffused with dusky above and below, nearly obscuring the markings. Expands. 1. 30 to 2. 00. Habitat, Oregon, California, Montana, Colorado, New Mexico, British America, Ontario, and Quebec. Occurs in August.

211. GRAPTA HYLAS EDW.

HYLAS BUTTERFLY.

Smaller than C. comma, with the margin of wings more incised, and the tails of hind pair, broad, much as in faunus, and the outer border above is broad, as in that species; the spots in the central cell of fore wing are inclined to fusion, and the spots are distinct, Fig. 31, j. On hind wings, the border incloses a row of light spots, as in faunus. Beneath, gray, as in progne, with the C bent in the middle, similar, but very slight, Fig. 31, jj. Expands, 1.70 to 1.80. Habitat, Colorado.

212. GRAPTA RUSTICUS EDW.

RUSTIC BUTTERFLY.

Size and form of faunus, the incisions of outer border being deep, and the tails broad; markings also similar but not as dark, being rather more reddish brown, and the inner edge of the bordering on hind wing, is more clearly defined, while there is less black within the light spots, Fig. 31, c. Beneath, the colors are fewer and more clearly defined; thus the outer half of wings is grayish, the inner, brown, and the greenish spots are larger and light edged. The C is bent and slight, Fig. 31, cc. Expands, 2.00 to 2.10. Habitat, California and Vancouver's Island.

213. GRAPTA FAUNUS EDW.

GREEN-BANDED COMMA.

Size of C. comma, but differs in having the outer border of wings, more deeply inscribed, the tails of hind pair broader, the black border wider, and all of the spots large and distinct, the two in central cell of fore wing being usually fused together, and there is a seventh spot on this wing, in the angle of the lower branches of the middle vein, Fig. 31, b; the line of demarkation, along inner edge of black border of hind wings, is better defined, leaving a clearer basal interspace. Beneath

the colors are darker than in comma, with greenish markings on outer half of wings. The C is much as in comma. Expands, 2.00 to 2.36. Habitat, Mountains of New England and New York, with the northern portion, Michigan, Nebraska, Washington Territory; British America, from the Atlantic to the Pacific, and occasionally, West Virginia to Georgia. Occurs in July and August.

214. GRAPTA SILVIUS EDW.

WOODLAND COMMA.

Wings, deeply incised as in *G. faunus*. Yellowish orange above, with black border narrow on fore wing, wider behind. Spots on fore wings as in comma. There is a series of yellowish spots in outer black border of hind wings, this border being well defined on inner edge. The spots on inner portion are small. Beneath, yellowish brown, faintly streaked with darker brown and grayish. The C is angular, with the lower portion thickest. Expands, 1.90 to 2.00. Habitat, California.

215. GRAPTA ZEPHYRUS EDW.

ZEPHRA BUTTERFLY.

Size of *C. comma* but with marginal inscriptions rather deeper, and color rather more orange. The marginal border is not as dark in shade as in comma, especially on hind wings, but the inner sub-marginal band is present, inclosing a row of yellowish spots on both wings. Inner markings on fore wings, as in comma, but those on hind pair are much more slight, Fig. 31, a. Beneath, decidedly grey, much as in *progne*, but there is a brown central band, not seen in that species, and same yellowish spots on outer portion of both wings, with a rather yellowish cast to the entire surface, and there are three elongated spots in central cell of fore wings. Expands, 1.80 to 2.00. Habitat, Montana, and Nevada to Mexico, also Arizona, Utah, California, and Oregon. Occurs in August.

216. GRATA GRACILIS GR.-ROB.

BROWN-BANDED COMMA.

Size of *G. comma*, but the palest of all our species of the genus, being pale yellowish orange; the markings above are about as in comma, but brown, not black; the border band is pale, narrow, and inconspicuous, this being especially noticeable on hind wings, where the markings are small but distinct, Fig. 31, k. Beneath, the outer half of wings is pale grayish brown, darker brown on inner half, with a band of clearer brown crossing middle of wings, and forming a dividing line between the two shades. The C is about intermediate between that of comma and

progne, Fig. 31, aa. Expands, 1.80 to 2.00. Habitat, White Mountains of New Hampshire, Quebec, British America, and Alaska.

217. *GRAPTA SILENUS* EDW.

SILENUS COMMA.

Form and size of *G. comma*, but with the deep color and heavy markings above of *faunus*. Beneath, color is quite similar to that of *progne*, being decidedly gray but very dark, and with a well defined blackish band crossing central portion of wings, Fig. 32, a; C as in *progne*.

OREAS is a darker, dimorphic form. Expands, 2.20 to 2.30. Habitat, California, Montana, Washington Territory and Vancouver's Island.

218. *GRAPTA PROGNE* CRAM.

GRAY-WINGED COMMA.

Size of *G. comma*, resembles the dark form of that species somewhat above, in having the hind wings very much obscured with dusky, Fig. 32, b, but the marginal band of fore wing is as wide as that of *faunus*, though the spots in the central cell are not fused. Beneath, differs from any of our species, in being uniformly grayish, without any decided wide bandings anywhere. The C is very narrow and angular, Fig. 32, bb. Expands, 1.80 to 2.20. Habitat, Northern and Western States, British America from the Pacific Ocean to Nova Scotia, and Southern Labrador.

219. *GRAPTA J ALBUM* BD.-LEC.

WHITE J BUTTERFLY.

Larger than comma, and quite unlike any other of our species in markings. Fore wings, bright reddish orange, lighter in spots and darker at base; three lines of spots on outer margin, the inner of connected crescents, and within these, are eight large spots of black, Fig. 32, c. Hind wings, rather duller, with a lighter margin, which is crossed by two rusty lines or bands, that enclose lighter, crescent-shaped spots. Within these, on upper margin, is a white spot, followed by a black one. Beneath, ashy white, banded on outer margin with dusky, inside of which is a line of black-bordered, bluish crescents, and inside this, is a wide space of whitish, spotted and transversely marked with brownish; white in this, is a narrow, zigzag, umber line, and the space within this is banded, lined, and spotted with brown and umber. White J as in Fig. 32, cc. Expands, 2.50 to 3.25. Habitat, Northern States, (rare in Eastern Massachusetts) British America from the Pacific Ocean to Nova Scotia and Southern Labrador.

GENUS XXIV.

VANESSA. PICTURED BUTTERFLIES.

Size, medium to large. Colors reddish or dark above, often banded or spotted. duller below, without the silvery C in middle of hind wing. Wings large, scalloped, not notched. Palpi and body, densely hairy. Antennae, shorter than the body, with the club suddenly enlarged. Hibernates as a perfect insect. TYPE, *V. MILBERTII* (Plate V, 3.)

220. VANESSA ANTIOPA LINN.

YELLOW-BORDERED BUTTERFLY.

Size, larger than that of the type. Deep purplish brown above, bordered on outer margin of both wings with yellow, in which are black transverse markings, within this, is a black band, in which is a row of purplish spots, and within this, on upper margin of fore wings, are two yellow spots, and this margin is black, finely marked with yellow, Fig. 32, d. Beneath, shining black, marked with black in narrow, zigzag lines, the yellow border is present but paler, and also the spots at apex of fore wings, but reduced in size. Expands, 2.40 to 3.60. Habitat, whole of North America. *LINTNERII* Fitch, is a reversion, with the outer yellow border widened, paler in color, and without purple sub-marginal spots.

221 VANESSA CALIFORNICA Bd.

CALAFORNIA PICTURED BUTTERFLY.

Size of *V. milbertii*, reddish orange on fore wings, with three conspicuous black spots, on upper border of fore wing, and three black spots, on wing below them. There is a sub-apical whitish spot, and both wings are bordered with black, without blue spots. Beneath, duller, brownish at base of wings, with a black, zigzag, dividing line. Habitat, California, Oregon, Nevada, and Colorado.

222. VANESSA MILBERTII GODT.

MILBERT'S BUTTERFLY.

Dark reddish brown above, with a sub-marginal band of reddish orange, paler within, divided on upper border of fore wing by a brown spot, and the outer division is whitish, within this, on fore wings, are

two black-ringed orange spots. The outer brown margin has a line of connected, reddish spots, on fore wings, and on hind pair, a row of bluish crescents. Beneath, duller, with numerous, transverse streaks of black, and a dividing, central line of black. Expands, 1.60 to 2.25. Habitat, Northern States to Montana; Colorado, Arizona, Pacific States; British America to Nova Scotia; Newfoundland.

GENUS XXV.

PYRAMEIS. PAINTED BUTTERFLIES.

Size, small. Colors bright, and the sexes are not dissimilar. Antennae, about three-fourths as long as the body, with the club enlarging suddenly, but pointed terminally. Differs from *Vanessa* in having the wings very angular, and the club of the antennae rather more pointed. TYPE, *P. cardui*. (PLATE V, 5.)

223. PYRAMEIS ATLANTA LINN.

RED ADMIRAL.

Dark velvety brown above, with a band of brilliant orange vermillion crossing the fore wing diagonally, outside of which the wing is black, and in the apex are six white spots, arranged as in Fig. 32, c, where there is a very slight indication of a bluish sub-marginal band. Hind wings with a patch in middle of outer margin, bright orange, containing four dots of black. On inner angle of wings, is a black spot, enclosing a blue center. Beneath, on fore wings the ground color is black, the vermillion band is repeated, but lighter at the ends; within it in central cell, is a narrow band of vermillion, within this a blue band, the basal upper margin is mottled with blue and there is a rude circle of blue outside of the vermillion band. Three of the inner white spots are repeated, and beyond these the apex is grayish, containing double black-ringed white spots. Hind wings marbled with black, brown, violet, and yellowish, showing greenish reflections. There are four greenish black-ringed spots with black, white centered pupils, and there is a yellowish spot on the middle of the upper margin. Expands 2.30 to 3.60. Habitat, North America generally.

224. PYRAMEIS HUNTERA FAB.

HUNTER'S BUTTERFLY.

Size about that of the type, *P. cardui*, and there is a general resemblance, but it differs in having a white dot in the outer red spot be-

tween the second and third branches of the middle vein of fore wing. Beneath, there are only two eye spots on hind wings instead of four, and these are large and prominent, Fig. 32, b. Expands, 1.95 to 3.71. Habitat of this and the following species, North America generally.

225. PYRAMEIS CARDUI LINN.

THISTLE BUTTERFLY.

PLATE V, 5.

Size, medium. Dark brown above, with six white spots in apex of fore wings, and with spottings and markings in orange as given in the plate. Beneath, the fore wings are marked much as above, but the orange becomes crimson lake, the brown is paler, the apex of the wings is grayish, and the white spottings are enlarged. Hind wings brownish with an intricate net-work of yellowish white and with four black centered eye spots, ringed inwardly, first with blue, then with black, then with brown, followed with yellow and black. The spots are not large, and the two middle are smaller than the two outer. These three species of the genus occur all the year in the warmer sections, and at intervals from May until August, in the latitude of Massachusetts and northward.

226. PYRAMEIS CARYE HUB.

CARYE BUTTERFLY.

Generally similar to *P. cardui*, but differs in having only four small white spots in apex of fore wings, the larger being replaced by one of orange. The other orange markings of the wing are more broken into spots, there being five of these, arranged as in Fig. 32 a, where the upper side of fore wing is given. On the hind wing the black spots are blue pupiled, the orange is clearer and more extended toward base of wing. Beneath, on fore wing, the markings are repeated, but there are four black spots in central cell, the upper of which is a bar and largest. On hind wings the four eye spots are uniform in size, crowded together, and single ringed with brownish, not double ringed. Expands 2.00 to 2.50. Habitat, California, southward to Chili, Arizona and Nevada.

GENUS XXVI JUNONIA. EYED WINGS.

Size medium. Colors, dull, with prominent bright spottings and eye spots. Antennae, about two-thirds the length of the body, enlarged suddenly as in the last genus, but it differs in being rounded terminally, not pointed. Also differs from *Pyrameis* in having the front legs compara-

tively naked, not covered with long hairs TYPE, J. COENIA. (Plate VI, 1.)

227. JUNONIA COENIA HUB.

BUCKEYE BUTTERFLY.

Size, medium. Above, yellowish brown with two eye spots on outer portion of both wings, the upper, on fore wings, being somewhat inconspicuous and colored as in the plate. There is an oblique band of yellowish buff crossing apex of fore wing, and within the central cell are two black-encircled spots of orange. There is a double sub-marginal band of yellowish buff on both wings, within which on hind wings, and on the lower portion of fore wings is a band of orange. Beneath, on fore wings paler, with the markings repeated, but the orange bars in central cell are enlarged, and there is a third bar at the base of the wing and a space below the cell is suffused with orange. Apex of wings marbled with rufous, and the small eye spot is sometimes double. Hind wings dark yellowish buff crossed with numerous lines of rufous, which show a tendency in many specimens to mass together near the outer portion of the wing, over the eye spots which are small, sometimes being represented by mere dots, at other times larger, with the upper double and with two intermediate dots. An extremely variable species, regarding size of eye spots and other markings. Expands 1.75 to 2.20. Habitat, Middle and Southern States, West, to the Pacific; rather rare in Massachusetts, and occasional in Maine and Ontario. Occurs in June and July in the north, and all the year in the extreme south.

227a. JUNONIA COENIA ORYTHIA Sm-Abb. Similar to the type, but differs above, in being much darker with all of the markings clearer, but is lighter below. Habitat, Southern States.

228. JUNONIA GENOVEVA CRAM.

GENOVEVE'S BUTTERFLY.

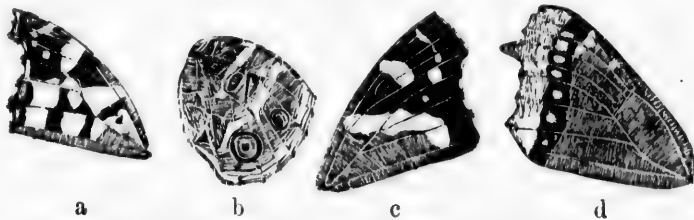
Similar to *J. coenia* but differs in being rather more reddish above, and in having the upper eye spots on both wings above but little larger than the other pair, see Fig. 33, a, where is given a cut of the upper side of hind wing. The color of the spots in the central cell of fore wing is reddish orange, not orange, and the same color tints the remainder of the cell, and all of the light space around eye spots, excepting portion between them, is also orange. Upper eye spot of hind wing is wholly black, with a slight pupil. Eye spots below on hind wing, always present, and a buff bar crosses the center of wing. Habitat, Arizona and southward, and some of the West Indies.

GENUS XXVII.

ANARTIA. SPOTTED AND BANDED BUTTERFLIES.

Size, medium. Colors, dull whitish or pale brown, banded, but not conspicuously, and spotted with darker. Club of antennae, enlarging gradually. Fore wings, produced at apex, and the hind pair are provided with quite a prominent angle near the middle of the outer border. Type, *A. jatrophae*. (Plate, VI, 2.)

Fig. 32.



a, upper side, fore wing, *Pyramela carye*; c, same, *P. atalanta*; b, lower side, hind wing, *P. carye*; d, upper side, hind wing, *Vanessa antiope*.

229 ANARTIA JATROPHAE LINN.

YELLOW AND WHITE BANDED BUTTERFLY.

Size, medium. Above, silvery white, with a marginal band on outer border of both wings enclosing a double series of yellowish crescents. Near middle of upper border of fore wing is an inconspicuous patch of dusky brown, from which a narrow band of the same color crosses the wing. There are two black-ringed spots of yellowish in the central cell and a yellow-ringed black spot in the space between second and third branches of the middle vein. Hind wings with two yellow-ringed black spots on outer third, and a dusky zigzag line crosses the middle of the wing. In the central cell are three dusky bars, from the inner of which a band crosses to the upper border. Beneath, the black dots are repeated and the dusky markings are reproduced in orange. Expands, 1.50 to 2.00. Habitat, Texas, where it is rare, and southward through Mexico and Central America.

GENUS XXVIII. EUREMA. BANDED REDS.

Medium to small in size. Colors above usually very bright, conspicuously banded with darker. Beneath, dull. The antennae are nearly as long as the body. Fore wings

not produced at apex, but the hind pair have a prominent angle, or tail, near middle of outer border. Fore legs, thickly covered with long hairs. TYPE, E. LETHE, (Plate six, 3.)

230. EUREMA LETHE FAB.

LETHE BUTTERFLY.

Size, medium. Above, yellowish orange, with apex of fore wings dark brown, enclosing four spots of the ground color, the two lower of unequal size, the outer being very small, the upper large, and reaching the upper border of the wing; the two outer are of irregular form, the lower being somewhat larger than the other. The wing is margined with brown, and a brown band crosses the wing diagonally on the lower third. Hind wing, with a short band of brown on the upper angle, and a double sub-marginal band of brown, the enclosed stripe being lighter than the surface color. Beneath, pale buff, with a rufous patch in the middle of outer portion of fore wing, a brown patch near middle of lower border, and an intricate pattern of rufous on the upper half of wing. Hind wing with an intricate pattern of rufous at base, and the outer portion of the wing is overwashed with rufous and crossed with a double band of rufous which encloses a pale stripe. Outside this is an irregular line of spots of rufous, the upper blue-pupiled, the others surrounded with a yellow and a rufous ring. There is a sub-marginal band of grayish, beginning at the tail and extending along the inner edge of the wing. Expands 1.72 to 2.00. Habitat, Texas, where it is rare, and southward.

CENUS XXIX.

EUNICA. VIOLACEOUS BUTTERFLIES.

Size, small. Colors, rather dull. Antennae, about two-thirds as long as the body, with the club enlarging gradually. Front legs but slightly hairy. Fore wings triangular, upper angle not produced. Hind wings oval without any prominent angles. TYPE, E. MONIMA. Plate six, 4.

231. EUNICA MONIMA CRAM.

VIOLET BUTTERFLY.

Size, small. Above, bronzy brown with violet reflections, and with indications of five white spots in apex of fore wings. The female is nearly without the violet reflections, and has the apex of fore wings dark

brown and the white spots prominent. Beneath, both sexes are bronzy brown with violet reflections, with a brown patch in the middle of the fore wings, in which are four white spots. There is a narrow band of brown crossing tip of fore wing and three bands crossing hind wings, the two outer have four yellowish-encircled dots between them, the upper of which is whitish pupiled. Expands 1.60 to 1.75.

GENUS XXX.

TIMETES. SABER-WINGED BUTTERFLIES.

Size, medium to large, varying in color from orange to brown above, often banded with darker. Antennae nearly as long as the body. Fore wings triangular, with the apex much produced and bent downward. Hind wings also triangular and provided with two tails, the outer of which is much the longest, Type *T. coresia* (Plate VI, 5.)

232. TIMETES CORESIA GODT.

BROWN AND WHITE SABER-WING.

Size, medium. Above, velvety brown, with purplish luster, palest basally, where are four faint bands of darker on fore wings, and two on hind. Outer margin purplish brown, within which is a fainter band of purplish. There is a marginal band of dark brown that encloses a line of reddish, which becomes bright at inner angle, and extends down into the short tail. There are two black crescents near inner angle. Beneath, outer portion of both wings violaceous brown, with pale bronzy reflections. Patch in apex of fore wings and marginal band, paler, the latter enclosing a reddish line as above. The brown is furrowed by a saolloped black line, against which rests a line of golden red, with the inner edge straight and the space between this and the base of the wings is silvery white, crossed by three lines of reddish, the outer reaching nearly to the lower edge of the hind wings, the next is a little shorter, and the third quite short. Body beneath, legs, and lower side of palpi white. Expands 1.50. Habitat, Texas, where it is rare and southward.

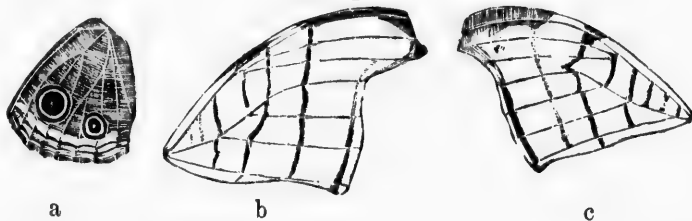
233. TIMETES PETREUS CRAM.

ORANGE SABER-WING.

Size, large. Apex of fore wings much produced and bent, Fig. 33. b. Outer tail .60 long, inner, .20. Above, bright reddish orange with the upper margin of fore wings bordered with dusky, more widely toward

apex. There are three black bands crossing both wings, and two or three in central cell of fore wings. On the hind wings the outer band is doubled, enclosing an orange line that becomes white on upper border, where the band is considerably widened. There is a dusky margin to hind wings, covering both tails, and this is darkened in the middle, while this dark center sends a band on to the fore wings, which fades toward the apex. The long tail has a white dot at tip, and above the short tail is a double bluish ringed black spot, and above this another with two rings, and above this a black dot. Beneath, pale brown with violet reflections and the lines are faintly indicated in darker. There is a line of points in outer portion of both wings. Expands 3.00 to 3.25. Habitat, Indian River, Florida, and southward.

Fig. 33.



a, hind wing, upper side, *Junonia genoveva*; b, fore wing, upper side, *Timetes petreus*; c same, *T. eleucha*.

234. TIMETES ELEUCHA DOUBL.-HEW.

SHORT SABER-WING.

Size, large. Similar to *T. petreus*, but differs in having the apex of fore wing not nearly as much produced; the second band is bent as seen in Fig. 33 c, the double band on hind wings is not greatly widened on upper border, and there is no white enclosed, the marginal band on hind wings is slight and double, but heavier and more extended on fore pair, there are three brownish eye spots near inner angle, black-pupiled and white-ringed, and lastly the tails are shorter; outer about .40, inner, .15.

235. TIMETES CHIRON FAB.

CHIRON SABER-WING.

Size of *T. coresia* but the apex of fore wings, although produced, is not bent as much, Fig. 34, a. Brown as in *coresia*, but both wings are crossed with four yellowish brown bands above; there are five dots in apex of fore wings and an extra eye spot in inner angle of hind wings. Beneath, the light lines are repeated in violaceous, and the white base

of the wings is crossed with four orange bands. The extra eye spot appears below. Expands 2.00 to 2.25.

GENUS XXXI. HYPOLIMNAS. TROPICAL NYMPHS.

Generally similar to *Limenitis*, but differs in having the club of the antennae enlarged suddenly, and the last joint of the palpi is longer and more pointed; sexes, dissimilar. TYPE, *H. MISIPPUS*. (Plate VII, 1.)

236. HYPOLIMNAS MISIPPUS LINN, WHITE-SPOTTED BUTTERFLY.

Size, large. Male, dark brown above, with a large oval patch of white in each wing, surrounded with a wide ring of violet reflections, and there is a smaller spot in apex of fore wing. Thorax, head, and palpi, dotted with white. There are two small spots of greenish metallic atoms at inner angle of hind wing. Beneath, brown, chestnut at base of wings, the white markings are repeated but enlarged, there are four bluish spots on upper portion of central cell. Both wings are bordered with black that encloses a double series of bluish crescents on fore wings, a line of crescents and a line of triangles, divided by the veins on the hind wings. Within this band on the hind wings is a line of bluish dots. There is a black spot on upper margin of hind wings. Female, pale chestnut, much the shade of *Danaus strigosa*, bordered on both surfaces as is the male below; apex of the fore wings and upper margin, dark brown, enclosing at apex a large white band, and above it are three or four small spots. On hind wing the black spot seen on the upper border of the lower surface of the male is present. Beneath, paler with markings repeated, but the apex of fore wings beyond the white band is very pale. The bluish spots of central cell of male are present, and there is an extra black spot at end of central cell of fore wing. Expands, 2.60 to 2.70. Habitat, West Indies, rare on Indian River, Florida.

GENUS XXXII.

LIMENITIS. NYMPH-LIKE BUTTERFLIES.

Medium size. Colors, usually dark, with bright markings, or sometimes reddish with dark markings. Antennae, about two thirds as long as the body, with the club enlarging gradually. Wings triangular; hind pair rounded, not tailed. TYPE, *L. ARTEMIS*. (Plate, VII. 2.)

237. LIMENITIS URSULA FAB.

BLUE-BANDED BUTTERFLY.

Similar to the type *L. arthemis*, but differs in the absence of the white band on both wings, and the reddish orange spots on the hind wings. Expands 2.75 to 3.10. Habitat, Atlantic States, Mississippi Valley, Kansas, and Ontario. (For form *proserpina* see appendix.)

237a, *LIMENITIS URSULA ARIZONENSIS*. Differs from the type in having fore wing much produced, as are also the hind pair. The marginal spots on fore wings are restricted to a single series, there being no trace of sub-marginal markings. The hind wings have two rows along the margin, the outer small. Habitat, Arizona.

238. LIMENITIS ARTHEMIS DRU.

WHITE-BANDED BUTTERFLY.

PLATE VII, 2.

Size, medium. Above, dark brown, both wings crossed by a wide band of white, with two white spots in apex of fore wings. Without the white band on the hind wings is a line of metallic green spots, on each of which rests a spot of reddish orange. There is a double sub-marginal series of metallic green crescents, most distinct on hind wings. Beneath, reddish with the markings repeated, but the orange spots are enlarged, the greenish line that precedes them is absent, and they are in a dark brown field. There is an additional reddish orange sub-marginal band on fore wing. In the central cell are two black-encircled reddish orange spots, with greenish and bluish markings, in the interspaces, near base of hind wings, are three black-ringed reddish spots, with a greenish spot inside them. Expands 2.50 to 3.10. Habitat, Northern United States, British America, British Columbia, Ontario, Quebec, and Nova Scotia. Both this species and the preceding occur in July.

239. LIMENITIS WEIDEMEYERII EDW.

WEIDEMEYER'S BUTTERFLY.

Size, large. Differs from the type *L. arthemis* in absence of any greenish above, in the white band being more divided into spots and narrower on fore wings, in the spots in apex of fore wings being larger, see Fig. 34, b, and in there being an extra band of small white spots near outer margin of both wings. Beneath, the markings are repeated but enlarged. There are indications of the reddish markings in the central cell of fore wings, and the basal portion of the hind wings is overwashed with whitish, cut by the black veins and banded with black at the base

of the wing. Expands 2.75 to 3.10. Habitat, Rocky Mountains to New Mexico, Arizona, Utah, and Nebraska.

239a. *LIMENITIS WEIDEMEYERII* SINE-FASCIA Edw. Similar to the type, but lacks the wide white central band. Habitat, Arizona.

240. *LIMENITIS DISIPPUS* GODT.

BANDED RED BUTTERFLY.

Above, brownish red, margined around both wings and along veinings, with black. There is a band of black crossing apex of fore wing much widened above, and enclosing three spots of white, Fig. 84, c, and another, also black, crossing middle of hind pair. There is a small, arrow-shaped spot of white in upper margin of fore wing between the band and apex, and a double series, including fringe. Beneath, paler, with markings repeated, but the white spots are enlarged, and there is an additional white dot in black enlargement of margin of central cell of fore wings, (sometimes present above) and occasionally a spot below this and also sometimes one or two at base of hind wings, and along inner margin of black band. Expands 2.25 to 3.16. Habitat, United States, north to Nova Scotia and Ontario, and into British America as far north as latitude 52 degrees. Occurs in the north in July, August, and September. This species resembles the Milk-weed butterfly somewhat, but may be at once known by the black band crossing hind wing. An aberrant form, possibly a sub-species, has been called *pseudodisippus* by Strecker. In this the black band on hind wings is absent and the triangular band of fore wings nearly wanting.

241. *LIMENITIS FLORIDENSIS* STREC.

FLORIDA BANDED BUTTERFLY.

Similar to *L. disippus* but differs in being deep mahogany brown above, and but little lighter beneath. And usually the extra white markings seen in occasional examples of *disippus* are present below, these are the spots near base of wings and spots within the black band of hind wing. Expands 2.25 to 3.00. Habitat, Southern States.

I can see no difference between the *L. floridensis* of Strecker named in 1878, and the *L. eros* of Edwards named in 1880, as the range of individual variation in this southern butterfly is considerable, thus two forms become inadmissible and as Strecker's name has priority I have used it. Indeed, with a large series of *disippus* and *floridensis*, under examination it becomes quite a serious question as to whether *floridensis* ought not to take sub-specific rank after all.

242. LIMENITIS HULSTII EDW.

HULST'S BUTTERFLY.

Similar to *L. disippus* above, but differs in having the apex of fore wings very pale above, in the absence of the triangular black band, and in the presence of four triangular white spots, all of uniform size, not irregular, in having a spotted band on hind wings with white edges, and in the absence of black margin to both wings. Expands 2.75. Habitat, Utah.

243. LIMENITIS LORQUINI BD.

LORQUIN'S BUTTERFLY.

Dark velvety brown above, with apex of fore wings tipped with a greater or less amount of reddish orange. Both wings are crossed by a white band as seen in *L. arthemis*, but it is more divided into spots than in that species. There are three white spots at apex of fore wing and one in central cell, Fig. 35 a. There are usually some traces of reddish spottings on hind wing outside the white band. Beneath, the white markings are repeated, but larger, and there is a sub-marginal band of spots, one at base of fore wing, some at base of hind wing white, and the upper and lower margins of hind wing are white. The red of apex on fore wing is more extended, and most of the ground color of the hind wing is red. The veinings are black, and there is a black band crossing outer third of hind wing, enclosing red spots. Expands 2.25 to 2.50. Habitat, California, Arizona, Nevada. Occurs in June, July, and August.

243a. LIMENITIS LORQUINI BURRISONII NOVO. Differs from the typical lorquini, in the entire absence of any red in apex of fore wing above, and in the presence of a series of red spots outside the white band on hind wing, and there are indications of a sub-marginal series of spots. Beneath, the white sub-marginal band of light spots is slightly indicated only, and when present is bluish not white, there are no white spots at the base of either wing.

I have described above, a form of *Limenitis* obtained by Mr. H. K. Burrison, in British Columbia, during July 1890, from Landsdowne, westward to Vancouver's Island. There is considerable variation from the type towards typical lorquini, but among the large series in the possession of Mr. Burrison, I have yet to see a single specimen that cannot readily be distinguished from the southern examples of lorquini, although it is quite probable that in intermediate localities intergrades will be found.

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EXPLANATION OF FIGURES ON PLATE VI.

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|--------|-------------------------|------------------------|----------------------------|--------------------------|---------------|
| 1. | <i>Junonia coenia</i> . | 2. | <i>Anartia jatrophae</i> . | 3. | <i>Eurema</i> |
| lethe. | 4. | <i>Eunica monima</i> . | 5. | <i>Timetes coresia</i> . | |

PLATE VL



1



2



3



4



5

North American Butterflies.

C. J. M.

Eurema

GENUS XXXIII.

HETEROCHROA. TROPICAL NYMPHS.

Quite similar to *Limenitis*, differs in the wings being shorter and rounder, not produced at apex of fore wings, nor in center of outer border of hind pair. Type *H. californica*. (Plate VII, 3.)

244. HETEROCHROA CALIFORNICA BUTL.

CALIFORNIAN NYMPH,

Size, large. Above, dark velvety brown. Patch at apex of fore wings, not reaching margin anywhere, reddish orange. There is a band of white crossing both wings, broken into spots on fore wings, but entire on the hind pair. The central cell of fore wing and upper margin of fore wing is bluish, with a black line crossing cell, and on either side of it is a black-encircled reddish spot. There is a reddish crescent on inner angle of hind wing surmounting a black dot. There is a faint lighter marginal band to both wings, enclosing a black line. Beneath paler, with markings repeated, but enlarged. There is a bluish sub-marginal band to both wings, a bluish edging to lower portion of white band on hind wing, and some bluish and reddish markings at base of hind wings. Expands 2.50 to 3.00. Habitat, California, Arizona, and Nevada.

GENUS XXXIV. APATURA, SPOTTED GRAYS.

Size, small. Color, gray on both surfaces, spotted and banded with black and white. Antennae, a little shorter than the short body. Fore wings much produced, but the apex is rounded. Hind wings much produced at inner angle, but the elongation is rounded. Form of sexes different, males having the wings more pointed. Type, *A. clyton*. (Plate VII, 4.)

245. APATURA CELTIS Bd-Lec.

LOTUS GRAY.

Size, small. Grayish brown above, lighter at base of wings. A double sub-marginal band of darker, most distinct on hind wings, enclosing yellowish. On fore wings, inside this a line of four whitish spots terminating below with a black, pupilless eye spot, yellow-ringed, then a line,

somewhat zigzag, of irregular sized whitish spots, the lower double; central cell whitish, with a dark band of black spots in it. Hind wing with six or seven yellow-ringed, pupilless eye spots; above the upper, on margin of wing, is a square whitish spot. Central cell with three dusky spots, and a dusky band outside of it. Beneath, markings on fore wings repeated but all excepting eye spots are paler. Also similar on hind pair but there are seven double-ringed eye spots, four of which, the largest, are pupiled. Expands 1.50 to 2.00. Habitat, Virginia to Gulf of Mexico, and Mississippi Valley.

246. *APATURA ANTONIA* Edw.

ANTONIA'S GRAY.

Differs from *A. celtis* in having two large pupiled eye spots on fore wings, both of equal size. Expands 1.50. Habitat, Texas.

246a. *APATURA ANTONIA MONTIS*. Differs from the type in being much more bluish. Habitat, Arizona and Colorado.

247. *APATURA LEILIA* Edw.

LEILIA BUTTERFLY.

Differs from *A. celtis* in having the hind wings more produced at inner angle, Fig. 34, f, in being more orange above, in having two eye spots without pupils in middle of fore wings above, and three below, pupiled and ringed. The light markings are lighter, and there is a band of white spots partly crossing middle of hind wing below. There are two dark marks only in central cell above, these being represented by bars, with a light space between them. Expands 1.80. Habitat, Arizona.

248. *APATURA ALICIA* Edw.

ALICE'S GRAY BUTTERFLY.

Differs from *celtis* mainly in being larger and much grayer in general coloration. Expands 2.25 to 2.35. Habitat, Gulf States.

249. *APATURA CLYTON* Bd-Lec.

CLYTON GRAY-WING.

Differs from *A. celtis* in the larger size, absence of eye spots on either surface of fore wings, in the band crossing fore wing being more continuous. There are two bands only in central cell of fore wing (Fig. 34, e,) but there is no conspicuous light space between them as in *A. leilia*. Expands 2.10 to 3.00.

249a. *APATURA CLYTON PROSERPINA* Scudd. is darker with the hind wings much obscured with dusky and the eye spots on both surfaces nearly obsolete. Habitat of both forms, New York, southward to the Gulf of Mexico, and westward through the Mississippi Valley into Kansas.

250. *APATURA FLORA*. Edw.

FLORA'S GRAY-WING.

Most like *A. clyton*, but differs in having both wings more pointed, in being much more reddish orange above, in having the marginal bands wider, the light spot on upper margin of hind wing is absent and the eye spots are larger. Beneath, the colors are clearer and brighter. Expands 1.75 to 2.50. Habitat, Florida and Texas.

251. *APATURA COCLES* LINT.

BLIND GRAY-WING.

Most like *A. celtis*, but the wings are more pointed than in any known member of the genus. There are two eye spots on fore wing, the lower larger, and the upper has slight indication of a bluish pupil. The central cell has two bars as in *A. leilia*. Hind wings, with the eye spots larger than in *celtis*. On fore wings below, are three eye spots, broadly ringed with yellow, but with slightly indicated pupils only. On hind wings the eye spots are large and oval. About the size of *A. celtis*. Habitat, Texas.

GENUS XXXV. *PAPHIA*. LEAF-WINGS.

Size, rather large. Colors, orange, or reddish above inconspicuously banded with darker. Beneath, grayish, banded with darker. Antennae, shorter than the short body, with the club enlarging very gradually. Wings, large and triangular, the apex of fore pair produced into an acute angle, and there is a tail in the middle of the hind pair, while the inner angle is also angulated. TYPE, *P. TROGLODYTA*, (Plate VII, 5.).

252. *PAPHIA TROGLODYTA* FAB.

ORANGE LEAF-WING.

Bright reddish orange above, broadly margined with dusky all around on both wings, excepting lower border of fore pair, There is

a black band at end of central cell and a small dot within the cell, a dusky spot on upper border of hind wing and an indistinct band crossing middle of wing. The female has a double band of black on fore wing not quite crossing to upper border, where it forms a rude Y, and the band on hind wing is much more distinct than in the male. Beneath, both sexes are glossy gray with the dark markings seen on the female showing indistinctly. There is a submarginal band of white dots on hind wings. Expands 2.00 to 2.40. Habitat, Western States, from Illinois to Texas; Nebraska.

253. PAPHIA MORRISONII EDW.

MORRISON'S LEAF-WING.

Similar to *P. troglodyta*, but the apex of fore wings, Fig. 35, a, is not as produced nor are the tails as long, the double band is present in the male on both wings and encloses round spots of the ground color. The female differs from that of *P. troglodyta* in being without marginal bands and other dark markings indistinct. Beneath, not quite so glossy as in *P. troglodyta*. Expands 2.35 to 2.60. Habitat, Mount Graham, Arizona, and Mexico.

GENUS XXXVI. DEBIS. THICKET BUTTERFLIES.

Size, medium. Colors, brown, with conspicuous eye spots. The three veins of the fore wings are considerably swollen at base. Antennae, long, slender, gradually enlarging into a rather thick club. Fore wings, triangular, not produced at apex. Hind pair rounded and scalloped. TYPE, *D. PORTLANDIA*. (Plate VIII, 1.)

254. DEBIS PORTLANDIA FAB.

PEARLY WOOD BUTTERFLY.

Above, deep rich brown. There is a dusky marginal band on outer border of both wings enclosing two yellowish bands. Within this a light space in which are three pupiless, but yellow ringed, eye spots on fore wings and five on hind. There is a dusky band crossing middle of wing. Beneath paler, with a violet tinging. Marginal bands repeated, the light ones violet, and a violet ring surrounds all the eye spots on both wings. These are pupiled; there are two small extra ones on fore wing and one extra double on lower angle of hind pair, and a second dusky band crosses middle of both wings. Expands 2.00 to 2.15. Habitat, from New England, where it is rare, west to the Rocky Mountains,

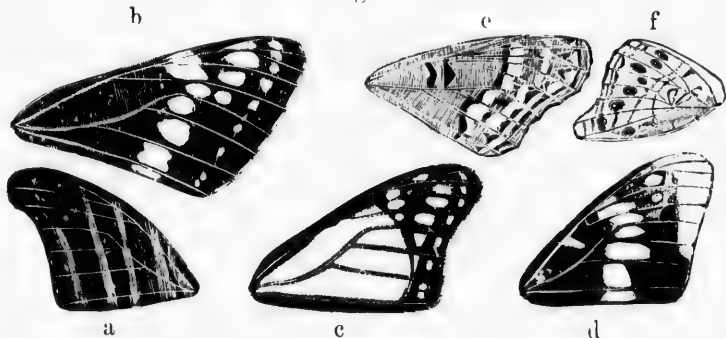
and south to the Gulf of Mexico; British America north to latitude 10 degrees.

GENUS XXXVII.

NEONYMPHA. QUAKER BUTTERFLIES.

Size, small, to medium. Colors dull, usually grayish, frequently with eye spots on one or both surfaces. Antennae, short, with the club enlarging gradually. Front wings triangular, with veins somewhat swollen at base, hind pair oval. TYPE, *N. EURYTRIS*. (Plate VII, 2.)

Fig. 34.



a, upper side, fore wing, *Timetes chiron*; b, upper side, fore wing, *Limenitis wiedemeyerii*; c, same of *L. disippus*; d, same *L. lorquini*; e, lower side, fore wing, *Apatura clyton*; f, lower side, hind wing, *A. leilia*.

NEONYMPHA CANTHUS Bd-LEC.

TEN SPOTTED QUAKER.

Size, rather large. Differs from the type *N. eurytris* in being larger, in having nine eye spots above instead of five, and these are without silver markings but are ringed with yellowish, Fig. 35, b, where is given the upper side of hind wing. There is also a dusky band crossing outer portion of fore wing preceeded outwardly by a light band. Beneath, the spots are ten, not six, and are double ringed, not single. Expands 1.87 to 2.16. Habitat, Northern States, Ontario, and Quebec. Occurs in July.

256. NEONYMPHA GEMMA HUB.

GEM QUAKER.

Size small. Differs from *N. eurytris* in being more reddish brown and in having no markings above, excepting a slight indication of two

or three spots on hind wings. Beneath, besides the two common bars crossing both wings the only markings on fore wings are three or four faint dots on outer portion of wing. On hind pair there are four silver centered black dots crowded together in a light space in middle of outer border, Fig. 35, c, while there are some silver markings above and below them. Expands 1.25 to 1.30. Habitat, West Virginia, south to the Gulf of Mexico. Occurs from June until September.

257. NEONYMPHA HENSHAWI EDW.

HENSHAW'S QUAKER.

About the size of the type *N. eurytris*, but is more reddish or rusty above, a dark band crosses middle of both wings, and there are two black dots in middle of outer border. Beneath finely marked with minute lines between the common bands. On outer portion of fore wings there is a wavy band, but no spots. In the middle of hind wing is a whitish space containing four dots in pairs, each with a silver center, Fig. 35, d. Above and below these are silver markings. Expands 1.50 to 1.70. Habitat, Arizona, Southern Colorado, and New Mexico.

258. NEONYMPHA AREOLATUS SM-ABB.

GOLDEN-RINGED QUAKER.

Smaller than *N. eurytris* but about the same color above but with out markings. Redder beneath, two common bars only on fore wings, on hind pair five yellow ringed, oblong black spots, each with a row of silver dots and all are surrounded with a rusty orange ring, Fig. 36, a. Expands 1.25 to 1.30. Habitat, Gulf States, East Tennessee, and occasionally New Jersey.

258. NEONYMPHA EURYTRIS FAB.

FIVE-SPOTTED QUAKER.

Brown above with three narrow sub-marginal bands and two yellow-ringed black spots, each with two dots of silver and three similar spots on hind pair. Beneath, paler with marginal bands clearer, spottings more distinct, and more clearly ringed, with an extra small spot on upper border of hind wing. Between the two central spots on both wings are silver markings. Two common reddish bands cross both wings. Expands 1.30 to 1.50. Habitat, Atlantic States, excepting perhaps Florida, and up the Mississippi Valley to Nebraska, Ontario and Quebec. Occurs in June, July, and August.

258a. *NEONYMPHA EURYTRIS VIOLA* Mayn., Fig. 36, b, differs from typical *N. eurytris* in being larger, lighter in color, with spottings above and below very large and clear, while the small upper and lower spot on hind wing is minute, and often missing. Expands 1.60 to 1.75. Habitat, Enterprise, Florida. Specimens from which I have made the above description were obtained by my friend, Mr. E. B. Clapp, at Enterprise, Florida, in the spring of 1888, and its distinctness from the more northern form appears to entitle it to the sub-specific rank given it in the Appendix of Butterflies of New England, page 71, December 1890.

259. *NEONYMPHA SOSYBIUS* FAB.

DARK QUAKER.

Smaller than *N. eurytris*, darker above, with no markings. Beneath paler with an indication only of spot in apex of fore wing. Hind wing with three spots, one above, Fig 37, a, two below, with slight indications of silver markings. Two common bands are present on both wings. Expands 1.10 to 1.25. Habitat, Middle and Southern States and the Mississippi Valley.

260. *NEONYMPHA RUBRICATA* EDW.

RUDDY QUAKER.

Pale brown above, reddish in central cell of fore wing, and faintly so in central cell of hind wing. There are three dark marginal lines. At apex of fore wing is an ochraceous-ringed black spot, containing two pearly dots, and there is a similar spot near inner angle of hind wing. Beneath, grayish brown, with reddish tinting brighter. Spots and marginal bands repeated, but there are two bars of rusty and there is a pearly spot above and below the black eye spot in apex of fore wings. On hind wings below is an additional black spot near upper angle, similar to the one below, and there are two yellow-ringed pearly spots between the two. Expands 1.20 to 1.80. Habitat, Texas and Arizona.

GENUS XXXIX. *COENONYMPHA*. YELLOW QUAKERS.

Size, small. Colors, dull yellow, with few or no prominent markings. Antennae, not more than one-half as long as the body, with club enlarging gradually. Fore wings, triangular, round at apex, hind pair, oval. TYPE, *C. ELKO*. (Plate, VIII, 2.)

261. COENONYMPHA CALIFORNIA WEST-HEW.

CALIFORNIAN YELLOW QUAKER.

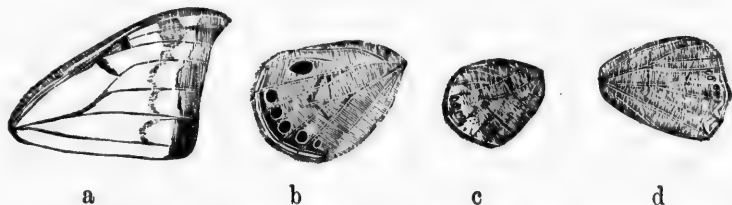
Larger than the type, *C. elko*, and paler above. Darker beneath, with a yellow-ringed dot at apex of fore wings, Fig. 37, b, and one not as distinct on inner angle of hind pair. There is a light band crossing fore wings, and an irregular band crossing the darker hind pair, and inside this band the wing is darker. The female has four spots on the hind wings and two on fore pair. Expands 1.20 to 1.45. Habitat, California and Montana.

261a. COENONYMPHA CALIFORNIA GALACTINUS Bd. Darker than the type, the basal portion of hind wings above showing considerable dusky. Beneath, quite dark, the light bands showing, through contrast more distinctly.

261b. COENONYMPHA CALIFORNIA ERYNGI H. Edw. Resembles typical *C. californica* but is much more yellow.

261c. COENONYMPHA CALIFORNIA PULLA H. Edw. Very much darker, inasmuch so that the markings beneath are very indistinct, and here is a reddish tint on middle of fore wings. Occurs in April and May.

Fig. 35.



a, upper side, fore wing, *Papilio morrisonii*; d, upper side, hind wing, *Neonympha canthus*; c, lower side, hind wing, *N. gemma*; d same, *N. henshawi*.

262. COENONYMPHA ELKO EDW.

ELKO YELLOW QUAKER.

Plate VIII, 3.

Bright yellowish orange above, with a silky luster, but without markings. Beneath, paler, dusky on apex of fore wings, with a faint bar of whitish at end of central cell. Dusky on hind wings, with an irregular band of whitish crossing middle of wing; no other markings. Expands 1.00 to 1.10. Habitat, Elko Nevada, and Spokane Falls, Washington.

263. COENONYMPHA INORNATA Edw.

PLAIN YELLOW QUAKER.

Differs from the type in being larger, in being ochery brown above, and lighter in central cell of all the wings. Beneath, grayish with a greenish tinge on hind wings, banded much as in the type, but the base of hind wings is darker than the portion outside the band. No spots on either surface. Expands 1.40. Habitat, Montana, British America and Newfoundland.

264. COENONYMPHA OCHRACEA Edw.

OCHRACEOUS QUAKER.

More ochery yellow above than in *C. elko*, and the size is larger. No spots nor markings. Beneath, grayish on apex, upper margin and base of fore wings. Near apex is a white-pupiled black spot, which is yellow-ringed. Hind wings, light reddish brown, grayish on outer margin and at base. Near outer margin is a series of six black dots, usually white-pupiled and broadly yellow-ringed. Near base are two irregular brown spots, and an interrupted band crosses middle of wing. Expands 1.40 to 1.60. Habitat, Montana to Arizona; Kansas and British America.

265. COENONYMPHA AMPELOS Edw.

AMPELOS QUAKER.

Similar to *C. elko* above, but paler beneath, and quite buffy at apex of fore wings. Hind wings paler than the fore pair. The light bands are present but do not cross either wing. No spots anywhere. Expands 1.30. Habitat, Oregon, Washington, Nevada, and Montana.

266. COENONYMPHA KODIAC Edw.

KODIAC QUAKER.

Light brown above, with a gray shade, and having a satiny gloss. Beneath, brownish from base to middle of wings lighter beyond, with gray scales on fore wings, and bluish scales on hind pair. No spots on either surface. Expands 1.50. Habitat, Kodiak, Alaska.

267. COENONYMPHA BRENDA Edw.

SOUTHERN YELLOW QUAKER.

Above, light buff without spots. Beneath, more yellow; there is a pale reddish line on fore wings without the central cell, not reaching either margin; on hind wings a similar line reaches from end of cell to lower margin. On apex of fore wings is a large round black spot, and

with a point below this. Hind wings have a more or less complete sub-marginal row of black dots. Expands 1.40 to 1.50. Habitat, Los Angeles, California.

268. COENONYMPHA PAMPHILOIDES REAK.

WHITE-DOTTED QUAKER.

Above yellowish. Hind wings beneath, mottled with greenish; brown from base to middle. Outer half of wings same color as above. There is a sub-marginal row of six white dots, each encircled with a brownish green ring. Expands 1.30. Habitat, California and British America.

GELUS XL. EREBIA. DUSKEY BUTTERFLIES

Size, small to medium. Colors, dark brown, or reddish brown, often unspotted, sometimes with a reddish patch on fore wings which may enclose black dots. Differs mainly from the last genus in not having the veins of fore wings much swollen at base, and in the prevailing dark color. TYPE, *E. EPIPSODEA*. (Plate, VIII, 4.)

269. EREBIA FASCIATA BUTL;

FASCIATED BUTTERFLY.

Dark brown above without markings. Beneath, lighter brown with a wide band of grayish on outer portion of both wings, not quite crossing to lower border of fore pair, when it becomes reddish, but reaches quite across the hind pair, Fig. 27, c, and there is an indication of a second bar near base of both wings; the bands are bordered with black. Female has a reddish patch on outer portion of fore, and band on hind wing above. Expands 1.80 to 2.00. Habitat, Alaska and Arctic America.

270. EREBIA DISCOIDALIS KIRBY.

DISCAL DUSKY BUTTERFLY.

Reddish brown above, with the upper border mottled with white and a large patch of reddish in middle of wing. Beneath similar, with the outer half of hind wing grayish, and some grayish markings in the middle of inner half, Fig. 37, d.

271. *EREBIA VESAGUS* DOUB.-HEW.

FOUR-DOTTED BUTTERFLY.

Differs from *E. discoidalis* in having a lightish patch beyond end of central cell, and a reddish patch near outer border of fore wing containing four black spots without white pupils. Expands 2.00. Habitat, British America.

272. *EREBIA ROSSII* CURT.

ROSS' DUSKY BUTTERFLY.

Dark brown above, with a double reddish spot near apex, each division of which contains a white-pupiled black dot. Beneath, spots on fore wing repeated, and on hind wing near outside portion is a pale band containing a series of white points. Expands 2.00. Habitat, Arctic America.

Fig. 36.



a, lower side, *Neonympha areolatus*. b, same, *N. eurytris viola*.

273. *EREBIA MANCINUS* DOUB.-HEW.

NORTH-WESTERN DUSKEY BUTTERFLY.

Size, small, dark brown above, with a triangular patch of chestnut near middle of fore wing, without spots. Expands 1.50. Habitat, Alaska and Rocky Mountains in British America.

274. *EREBIA HAYDENII* EDW.

HAYDEN'S BUTTERFLY.

Pale slaty brown, without spots or markings. Beneath, paler with a sub-marginal row of white-pupiled, rusty-ringed, brown spots on hind wings, Fig. 37, e, and three or four points, also rusty-ringed on fore pair. Expands 1.60. Habitat, Montana. Occurs in August.

275. *EREBIA CALLAIS* EDW.

COLORADO DUSKY BUTTERFLY.

Brown above, with a silky gloss. There is a sub-triangular chestnut patch on outer third of fore wing, encircling a double black spot each division of which has a white pupil. There are three small black spots on hind wings just outside the central cell, each chestnut-ringed. Beneath, reddish brown, gray on hind wings, with the markings above present on both wings. Expands 1.50. Habitat, Colorado and New Mexico.

276. *EREBIA EPIPSODEA* BUTL.

DOTTED DUSKEY BUTTERFLY.

Plate VIII, 4.

Dark reddish brown above, with a yellowish red patch on outer portion of both wings. There is a double black spot in upper portion of that on fore wings, each division of which is white-pupiled, below this are two others, the first small, and the lower larger and white-pupiled. On hind wings the patch is often divided into spots, three of which have black centers, often white-pupiled. Beneath, the fore wings are reddish, with markings repeated; on hind wings grayish, with markings nearly absent. Habitat, Colorado, New Mexico, Montana, Washington, British America, and St Michaels, Alaska. Occurs in June and July.

277. *EREBIA ETHELA* EDW.

ETHEL'S BUTTERFLY.

Similar to *E. epipsodea*, but differs in having six spots in the reddish field on fore wings, and five on hind pair. Beneath, the reddish is replaced by yellowish-buff. Expands 1.50. Habitat, Yellowstone Park.

278. *EREBIA SOFIA* STR.

STRECKER' DUSKY BUTTERFLY.

Dark brown above, fore wings crossed by a band of rusty yellow, and there is a tint of the same color in the central cell. Hind wings, with a sub-marginal row of brown spots. Beneath, dark rusty red on fore wings, paler in central cell, banded as above. Hind wings brown, with the brown spots replaced with white. Expands 1.50. Habitat, Fort Churchill, British America.

279. *EREBIA MAGDALENA* STR.

MAGDALEEN'S BUTTERFLY.

Size large. Dark blackish brown on both surfaces, with a purplish tinging above, without spots or markings. Expands 2.00. Habitat, mountains of Colorado. Occurs in June and July.

GENUS XLI.

GEIROCHEILUS. MOUNTAIN WOOD BUTTERFLIES.

Size, medium. Colors, dark brown dotted with white and marked with reddish. Both wings rounded, hind pair scalloped on outer margin. Veins of fore wings, swollen at base. Antennae, not as long as body, club enlarging gradually. TYPE, *G. TRITONIA*. (Plate VIII, 5.)

280. *GEIROCHEILUS TRITONIA* EDW.

TRITON BUTTERFLY.

Brown above, lighter on outer border of fore wing and at base of both pairs. Outer margin of hind wings yellowish red, and there is a submarginal band of dusky on both wings. On outer portion of fore wings are four spots of white, and three on hind pair. Beneath, similar, white spots larger, and the reddish margin of hind wing is tinged with bluish. Expands 2.00 to 2.30. Habitat, Southern Arizona.

GENUS XLII. *HIPPARCHIA*. GRAY-WINGS.

Size, medium. Colors, dull, usually grayish, frequently with small eye spots on one or both surfaces. Antennae, short, with the club enlarging gradually. Fore wings, triangular, and pointed at apex, with veins somewhat swollen at base, hind pair, oval. TYPE, *H. RIDINGSII*. (Plate, VIII, 6.)

281. *HIPPARCHIA RIDINGSII* EDW.

RIDINGS' BUTTERFLY.

Size, small. Ashy brown above, with a band of elongated yellowish spots crossing both wings, interrupted in middle of fore wings. On the fore wings are two small, oval spots, white-pupiled, Plate VIII. Hind wings without spots. Beneath, a little paler, much lined with brownish.

Spots, not much enlarged, and there are none on hind wings. Expands 1.80 to 2.00. Habitat, Colorado, Montana and Nevada.

282. HIPPARCHIA DIONYSIUS SCUD.

SCUDDER'S WOOD BUTTERFLY.

Differs from *S. ridingsii* in being larger and paler, with the brown markings below fainter and fewer. Expands 2.00. Habitat, Utah.

GENUS XLIII. SATYRUS. WOOD BUTTERFLIES.

Size, medium to large. Colors dark with prominent eye spots on fore wings and sometimes with reddish patches. Veins, swollen at base. TYPE *S. ALOPE*. (Plate, IX, 1.)

283. SATYRUS PEGALA FAB.

SOUTHERN WOOD BUTTERFLY.

Size, large. Differs from the type in the larger size and usual absence of the second lower eyespot on the fore wing and the one present is proportionately small, Fig. 38, a. Beneath, rather grayer than *alope*, and there are six prominent eye spots on hind wing. Occasional specimens have the two eye spots on fore wing. Expands 2.40 to 3.00. Habitat, Gulf States, rare on Coast of New Jersey, and at Mount Holley, New Jersey.

284. SATYRUS ALOPE FAB.

YELLOW-SPOTTED BUTTERFLY.

Size, medium. Dark brown above, with patch of reddish orange on outer portion of fore wing, in which are two white-pupiled black spots, the white frequently encircled with bluish. On hind wings is frequently a white-pupiled black dot. Beneath paler, much lined with blackish, markings of fore wing similar, and there are from four to six eye spots on hind wings. Expands 1.60 to 2.25. Habitat, New England, excepting northern portion, and New York south to North Carolina. Occurs in July, August, and September.

284a. SATYRUS ALOPE TEXANA, Edw. Similar to type, but much paler, more like *pegala* but with two eye spots on fore wings.

284b. SATYRUS ALOPE MARITIMA Edw. Smaller than the type, darker, with the patch on fore wing restricted and much brighter in color. Habitat, Martha's Vineyard, Eastern New Jersey, and Grand Menan, New Brunswick.

285. SATYRUS NEPHELE KIRBY.

BROWN WOOD BUTTERFLY.

Differs from the type in the mere indication of the reddish orange patch on fore wings. Sometimes this patch is more distinct than at others, and thus specimens appear to approach alope, but I look upon such examples as reversions towards some ancestral type, which was possibly *S. pegala*. Expands 1.50 to 2.00. Habitat, northern New England, Ontario, Quebec, New York, and British America. Occurs in July and August.

285a. SATYRUS NEPHELE OLYMPUS Edw. Paler than the type in general coloration and averaging larger. Habitat, Illinois to Rocky Mountains and British America.

285b. SATYRUS NEPHELE BOOPES Behr. Smaller than typical *S. nephele* and darker, there being little or no light area on fore wing. Habitat, California to Washington.

285b1. SATYRUS NEPHELE BOOPES INCANA Edw. Similar to sub species *boopes* but differs in having the lower side washed with whitish. Habitat, Washington.

286. SATYRUS ARIANE Bd.

ARIANE'S BUTTERFLY.

Similar to *S. nephele* with two eye spots, white-pupiled and pale-ringed on fore wings. Six small ones on hind wings below, white-pupiled and yellow-ringed and this wing is crossed by wavy lines. Expands 1.50. Habitat, California and Weber Mountains, Utah.

287. SATYRUS PAULUS Edw.

PAULUS BUTTERFLY.

Similar to *S. boopes*, but yellower below, and much clouded with whitish on hind wings, while the general markings are more distinct. Expands 2.00. Habitat, California, Sierra Nevada, San Bernardo, and Nevada.

288. SATYRUS BARONI Edw.

BARON'S BUTTERFLY.

Differs from *S. nephele* in being reddish brown above, pale beneath and the outer half of hind wing is whitish or brownish gray. Spottings much as in *S. ariane*. Expands 1.50. Habitat, Northern California.

289. SATYRUS GABBII Edw.

GABB'S BUTTERFLY.

Light yellowish brown above with clouded yellowish red on fore wings, and an obscure yellow shade over outer half of hind wings. On these wings are four eye spots, lowest largest pupiled, and all are yellow-ringed. Beneath paler, uniformly streaked with brown. Six eye spots on hind wings beneath. Expands 1.80. Habitat, Oregon and Weber Mountains, Utah.

290. SATYRUS WHEELERII Edw.

WHEELER'S BUTTERFLY.

Light brown above, clouded with darker, with the sub-marginal bands on both wings showing. There are two eye spots on fore wings, the upper inclined to be double and has two pupils, there is an eye spot on hind wing. All the spots are white-pupiled and yellow-ringed. Beneath, very pale with spots on fore wings enlarged, and there are six on hind wings, the second from upper side oval, all are white-pupiled and pale yellow-ringed. There is a central band of brown and the remaining surface is much lined with brown. The female is larger and paler. Expands 2.00 to 2.30. Habitat, Apache, Arizona; Owen's Lake, Southern California; and Southern Utah.

291. SATYRUS MEADII Edw.

MEAD'S BUTTERFLY.

Pale brown on fore wings above, rusty in the central cell and in the field which includes the eye spots, of which there are two, pupiled, and one on inner angle of hind wing. Brown beneath but more rusty, this tinting extending over the entire surface of fore wings. Eye spots large and yellow-ringed. Expands 1.50. Habitat, Montana to Arizona.

292. SATYRUS SILVESTRIS Edw.

SYLVAN BUTTERFLY.

Dark brown above, with a single pupilless eye spot on fore wings, the female however has two, yellow tinted beneath, the eye spots on fore wings are yellow-ringed, and on the hind wings are from one to six black dots. Expands 1.60 to 1.80. Habitat, California and British Columbia.

293. SATYRUS OETUS Bd.

CALIFORNIAN WOOD BUTTERFLY.

Dark brown above, with two small pupilless eye spots on fore wings. Yellowish below, and the two eye spots are larger, white-pupiled and yellow-ringed. There are one or two white spots on hind wings and a band of reddish across middle of wing. Expands 1.50 to 1.60. Habitat, Northern California.

294. SATYRUS CHARON EDW.

CHARON BUTTERFLY.

Dark brown above, with a single pupilless eye spot on fore wing, female with two, yellow tinted beneath, with a grayish washing. There are two yellow-ringed eye spots on fore wings and from one to six on hind pair. Expands 1.40 to 1.50. Habitat, New Mexico to Montana and British America.

Fig. 37.



a, lower side, hind wing, *Neonympha sosybius*; b, upper side, fore wing *Coenonympha californica*; c, lower side, hind wing, *Erebia fasciata*; d, same, *E. discoidalis*; e, same, *E. haydeni*.

295. SATYRUS STHENELE Bd.

SAN FRANCISCO BUTTERFLY.

Size, small. Fore wings not as much rounded at apex as in other members of the genus already described. Dark brown above, with two black, white-pupiled eye spots on fore wing, and a sub-marginal dark band on hind pair. Beneath, paler, lined with darker, there is a broad irregular band on middle of hind wing, on either side of which is a whitish band. The eye-spots on fore wing are much enlarged and are yellow-ringed. Expands 1.50. Habitat, San Francisco, California. Said to be extinct.

GENUS XLIV.

CHIONOBAS. BARREN-GROUND BUTTERFLIES.

Size, medium. Color, either yellowish or dark, without prominent markings. Palpi and body, very hairy. Antennae, short, about half the length of the body, with the club enlarging gradually. Fore wings, rather pointed at apex; hind wings oval. TYPE C. SEMIDEA. (Plate IX, 2.)

296. CHIONOBAS GIGAS BUTL.

GIANT BUTTERFLY.

Size, large. Above yellowish orange, margined all around both wings with dusky. There is a patch of dusky below the central cell of fore wings, and the hind wing is lined with darker. There is a white-pupiled black spot on hind wing near inner angle, and two in fore pair, with a dot between them, Fig. 38, a. Beneath, paler on fore wing, margined with grayish, lined with darker. The two-pupiled spots are repeated, but the dot is absent. Hind wing whitish, lined and mottled with brown and bluish, with the markings massed into a swollen central band, and nearer the base. Female, paler, with the patch on the fore wings below cell absent; there is a second dot below the lower pupiled spot. Beneath, the middle dot is present. Expands 2.40 to 2.50. Habitat, Vancouvers Island.

297. CHIONOBAS IDUNA EDW.

IDUNA BUTTERFLY.

Similar to *C. gigas*, but differs in being paler on both surfaces with fewer markings on both surfaces of hind wing. Males have one spot only on fore wing, Fig. 38, c, and none on hind pair, but this is pupiled. Females have two spots on fore wings, the upper only pupiled, above each is a dot; a pupilless spot on hind wing. All three spots beneath are pupiled. Expands 2.50 to 2.60. Habitat, Mendocino, California.

298. CHIONOBAS CALIFORNICA Bd.

CALIFORNIAN BARREN-GROUND BUTTERFLY.

General coloration similar to *C. gigas* but differs in having one pupiled eye spot on fore wings above, the lower being represented by a pupilless dot. Hind wings with pupiled dot, on lower side the dot is absent but the other spots are present. The female has a dot below lower. a spot which is larger than in the male, but without pupil, but both

spots are pupiled on the lower side, but the middle dot is absent, and the dark markings are more numerous than in the female of *C. gigas*. Expands 2.40. Habitat, Mt. Hood, California.

299. *CHIONOBAS NEVADENSIS* FELD.

NEVADA BARREN-GROUND BUTTERFLY.

Similar to *C. gigas* in color above. In central cell and below it and along upper border of fore wing, dusky. Both wings are margined with a darker color. There is a short triangular patch on upper border of hind wing of dusky. Near apex of fore wing is an eye spot, and another near inner angle of hind pair, both without pupils. Clearer beneath, bandings of fore wings dusky only, that at basal portions of hind wing, is wanting, but these wings are much lined with dusky, with the usual two bands crossing them. Eye spots, repeated but not pupiled. Expands 2.25. Habitat, California.

300. *CHIONOBAS CHRYXUS* WEST-HEW.

DULL ORANGE BUTTERFLY.

Dull orange above. Dusky on basal half of fore wings, and also on upper and outer border. There are two oval eye spots, both pupiled, and a dot between them. Outer border of hind wings, mottled with black, and the entire wing is mottled and lined with dusky. There is a single pupilless eye spot. Clearer beneath, with less dusky on fore wings. Hind wings, with the usual bands. Expands 2.25. Habitat, Colorado along the Rocky Mountains into British America.

301. *CHIONOBAS CALAIS* SCUDD.

CALAIS BUTTERFLY.

Deep ochraceous brown above, flecked with black on upper and outer margin of both wings, with two, three, or five, pupilless eye spots near outer margin. Hind wings, indistinctly marked with darker. One blind eye spot. Marbled with yellowish and brown beneath, the hind wings with a dark double band. Eye spots on fore wings as above, but some are pupiled. Eye spot on hind wings reduced to a mere dot. Expands 2.20. Habitat, Rupert House, Hudson's Bay, and Newfoundland.

302. *CHIONOBAS INVALLDA* MEAD.

NEVADA BARREN-GROUND BUTTERFLY.

Fore wings above, brown, mottled with yellowish along upper margin. There is a sub-marginal band of yellowish, divided into patches

by the veinings, and in the second patch near upper margin is an oval black spot, white-pupiled, and in the second patch from lower margin is a pupilless dot. There is a dusky bar crossing end of central cell, and joining a patch beneath the cell. Hind wings, yellowish, clouded with dusky, and there is a pupiled black dot near inner angle. Beneath, fore wing yellowish, marbled at base and along upper and outer margin with dusky, and crossed by two dusky bands. The upper pupiled spot only is present, hind wing crossed by two brown bands, and much lined with brown. Female has the fore wings yellow, crossed beyond cell by a narrow, dusky band, and there are two extra eye spots between the two, both pupiled. Beneath, similar to male but with the four eye spots pupiled. On hind wings is a large pupiled eye spot, and two or three small ones, all pupiled. Expands, 1.80 to 2.40. Habitat, Nevada and Eastern California. Occurs in July and August.

303. *CHIONOBAS VARUNA* EDW.

DAKOTA BUTTERFLY.

Above brown, often reddish or yellowish, upper margin of fore wings banded with dark brown, dusted with white near base. Apex and outer margin also bordered with brown. Beyond the central cell, are from one to four small black eye spots. Hind wings have a narrow brown border, and all the wings are edged with dark scales. The eye spots vary from one to five, or sometimes there are none. Paler, beneath, on fore wings, sprinkled with brown on upper and outer margin, striped with brown in the central cell, and near its outer end are two whitish patches, while all around the outer margin is a line of white dots. The eye spots are repeated and white-pupiled. Hind wings, mottled with light and dark brown and white, varying in amount with individuals. There is a dark line crossing middle of wing, and a line of white dots along outer margin. The eye spots are five, and white-pupiled. Expands 1.60 to 1.75, Habitat, Dakota and Calgary, British America.

304. *CHIONOBAS UHLERI* REAK.

UHLER'S BUTTERFLY.

Size, small. Reddish buff above, darkest on outer and upper margins and in basal two thirds of central cell of fore wings. There is a pupiled eye spot near apex, Fig. 39, a. Hind wings, much lined with dusky, and with a dusky sub-marginal band; there are two eye spots. Beneath, paler, with the eye spot repeated on fore wing, and the wing lined with dusky. Hind wings, without eye spots and the linings are much coarser. Expands, 1.75 to 2.00. Habitat, Colorado and Montana.

305. CHIONOBAS TARPEIA EPS.

TARPEAN BUTTERFLY.

Brown above, yellow tinted. Wings all around margined with darker. Near apex of fore wing are three or four eye spots. Hind wing, with four or five eye spots. Pale beneath, and the eye spots are repeated but are white-pupiled. Expands 1.60. Habitat, Europe and Arctic America.

306. CHIONOBAS TAYGETE HUB.

TAYGETE BUTTERFLY.

Dark brown above, (female pale yellowish brown,) with darker marginal bands. Outer border narrowly edged with black. Flecked with hoary on apex of fore wings beneath, and on whole of hind wings, excepting on edges of middle band, and on a darker sub-marginal band. Sometimes there is an indistinct eye spot, but this is usually absent; there are faint yellowish-white spots on outer portion of hind wing. Beneath, paler than above, and there is sometimes an indistinct white spot. Hind wings much as in *C. jutta*, with veins distinctly flecked with white. Expands 1.78 to 2.14. Labrador and Alaska.

307. CHIONOBAS JUTTA HUB.

BARREN GROUND BUTTERFLY.

Size, medium. Above, yellowish brown, with a sub-marginal row of reddish yellow spots crossing both wings, the upper and lower of which on fore wings, have dark centers, and there is a pupilless eye spot on the inner angle of hind wings. Beneath, paler, with spots on fore wings repeated, and the upper is white pupiled. Apex and upper margin, marbled with black and white. The hind wings are marbled with black and white, with a wide, darker central band, margined outwardly and inwardly with white, and there is a sub-marginal row of white dots. Expands, 1.65 to 2.15. Habitat, British Columbia, Quebec, Hudson's Bay, Labrador, and Orono, Maine.

308. CHIONOBAS SEMIDEA SAY.

WHITE MOUNTAIN BUTTERFLY.

Plate IX, 1.

Size, small. Above, blackish brown, yellowish along veins at base of wings, mottled on outer portion of hind wings and along upper border of fore wings, with dusky. Beneath, paler, blackish mottled at apex and along upper and outer border of fore wing. Hind wing much mottled with black on basal two thirds, less so on the outer third, and these

two portions are divided by a white band. Expands, 1.60 to 1.95. Habitat, White Mountains, New Hampshire; Labrador, Ungava Bay, and Quickstep Harbor, Gulf of Cumberland. Occurs in July and August.

309. CHIONOBAS CRAMBIS FREY.

CRAMBIS BUTTERFLY.

Varying from dark to yellowish brown above, sometimes with small pale eye spots. Hind wings with markings below showing through. On fore wings, beneath, similar, but hoary at apex. Hind wings marbled with dark brown, ochraceous brown, and grayish white, with a darker middle band, bordered with whitish. Expands 1.78 to 2.12. Habitat, Labrador, Arctic America, Alaska, Colorado; and New Mexico.

310. CHIONOBAS SUBHYALINA CURT.

ARCTIC BARREN-GROUND BUTTERFLY.

Wings, semi-transparent. Upper portion of fore wings flecked with black and white. There are two small white-pupiled, black spots near apex of fore wings showing most distinctly below. On fore wings similar, beneath; on hind wings spotted with black and dirty white, and there are three or four white dots. Expands 1.70. Habitat, Arctic America.

GENUS XLV. LIBYTHEA. BEAKED BUTTERFLIES.

Size, medium. Colors, dark, relieved by orange and white spots. Palpi, very long, in the form of a beak. Fore wings, long, narrow, much produced at apex. Hind wings, short, and straight on outer margin. Antennae, short, not half as long as the body. The males have four perfect feet, the females six. Type, *L. bachmani*. (Plate IX 3.)

311. LIBYTHEA BACHMANI KIRTL.

BACHMAN'S BUTTERFLY.

Dark brown above with three white spots in apex of fore wings, a reddish orange elongated spot in central cell, and a triangular patch of same color below it. Hind wings with a triangular patch of reddish orange. Beneath, similar on fore wings with markings, excepting white spot in apex, which is indicated only, repeated, but the orange is more extended, filling the cell. Tip of fore wings and whole of hind pair, overwashed with grayish, and there is a whitish bar across the hind wing, but the orange spot is absent. Expands, 1.40 to 2.00. Habitat, At-

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EXPLANATION OF FIGURES ON PLATE VII.

1. *Hypolimnias misippus*. 2. *Limenitis arthemis*. 4. *Apatura clyton*.
3. *Heterochroa californica*. 5. *Paphia troglodyta*.

PLATE VII.



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5

North American Butterflies.

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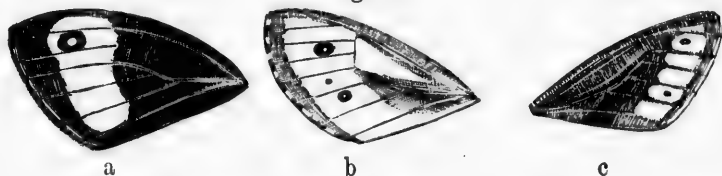
lantic States, but very rare in New England, Texas, Arizona, Ontario and Mississippi Valley.

312. LIBYTHEA CARINENTA GRAM.

PALE BEAKED BUTTERFLY.

Similar to *L. bachmani* but differs in being paler especially on hind wings, with the orange markings yellowish and in having four white spots on fore wings, Fig. 39 b. Beneath, the white spot in apex is present but the orange spot below the cell is not enlarged, and is pale yellowish. Expands 1.80. Habitat, Texas, New Mexico, Arizona, and southward.

Fig. 38.



a, upper side, fore wings, *Satyrus pegala*; b, upper side, fore wing; *Chionobas gigas*; c, same, *C. invalida*.

Family III. ERYCINIDAE. Herbage Butterflies.

SIZE, SMALL OR MEDIUM. ANTENNAE, STRAIGHT, WITH THE CLUB ROUNDED, NEVER HOOKED. CENTRAL CELL OF BOTH WINGS, OPEN.

GENUS XLVI.

LEMONIAS. WHITE-DOTTED BUTTERFLIES.

Size, small. Colors, black and orange or reddish, much dotted with white. Fore wings, long and triangular, rather pointed at apex. Hind wings, short and rounded. Antennae, nearly as long as the body, with the club enlarging gradually. TYPE, *L. VIRGULTI*. (Plate, IX, 4.)

313. LEMONIAS VIRGULTI BEHR.

PACIFIC LEMONIAS.

Plate IX, 4.

Reddish orange above, both wings margined with brown, this color occupying the basal half of hind wings. There is a sub-marginal row

of white dots in brown edging on both wings, within this an irregular band of black, white-edged, and somewhat interrupted on hind wings. Within this on fore wing are three black-ringed, white spots, and an orange one; on hind pair, three black-ringed white spots and three orange, the last small and arranged in a row. Beneath, orange on fore wing only, without brown upper margin, otherwise the brown is paler and extends over entire surface. Spottings repeated, enlarged and there is a second line of white dashes along outer margin of both wings. Expands, .90 to 1.25. Habitat, Southern California.

314. LEMONIAS DURYI Edw.

DURY'S DOTTED BUTTERFLY.

Size, small. Reddish orange above, both wings bordered with brown, which contains a row of white dashes, each of which has a black dot. Crossing middle of both wings is a row of black spots some of which are edged inwardly with white. Each wing has a white spot at end of central cell, edged on both sides with black and there are some black spots. Fore wings beneath paler, with markings repeated. Hind wings, ashy brown, with spots and dashes repeated, but enlarged, and there is a row of small white spots, crossing middle of wings. Expands .90 to 1.19. Habitat, New Mexico. Occurs in April.

315. LEMONIAS NAIS Edw.

NAIS BUTTERFLY.

Size, medium. Deep reddish orange above, both wings bordered all around with dark brown, and both wings are crossed by about four bands of dark brown, on upper margin of fore wings is a small white spot Fig. 39, c, and another near inner angle of hind wing. These spots are double in the female, and there is an additional pair on lower border of fore wing. Beneath, on fore wings, pale orange, without border, excepting a narrow line on outer margin of both wings. On hind wings the orange is much obscured with bluish. The bandings are repeated, but broken into spots, Expands 1.30 to 1.50. Habitat, Arizona, New Mexico, and Colorado. Occurs in July and August.

316. LEMONIAS PALMERII Edw.

PALMER'S BUTTERFLY.

Size, small. Pale brown above with outer margin and base of wings orange. There are two rows of white spots, crossing outer portion of both wings, and six or seven white spots within these. All of the spots

are black edged, outwardly and inwardly. Beneath, pale orange with white spottings repeated. Expands 1.00 to 1.20. Habitat, Utah and Arizona. Occurs in June and July.

317 LEMONIAS MORMO FELD.

FELDER'S BUTTERFLY.

Dusty yellow on both surfaces; both wings crossed by a sub-marginal band of spots, each black and white ringed. On fore wings there is a spot in central cell, and three spots nearer base. On hind wings there are two dots in central cell. Beneath, paler, with the spots repeated, but much larger and nearly confluent. Expands .90 to 1.10. Habitat, California, Utah, Arizona, and New Mexico.

318. LIMONIAS CYTHERA EDW.

CYTHERA BUTTERFLY.

Similar to *L. virgulti*, but differs in having the second band of white spots on fore wing incomplete, this being represented by four spots on the upper margin and one below, in having the base of wing above dark brown, and in having three white spots along the lower margin in the brown border. Expands 1.10. Habitat, Arizona.

319. LEMONIAS ARES EDW.

ARES SPOTTED BUTTERFLY.

Brown above, tinged with reddish on outer portion of fore wing, and on upper margin of hind pair. On fore wings is a sub-marginal row of indistinct dots, within which is a row of black crescents, then a short row of black spots at end of central cell, and a little nearer base is a row of similar spots crossing wings. There are three rows of indistinct spots crossing base of cell. Hind wings, with a sub-marginal row of black dots, then a row of small spots, followed by a short row at end of cell. Rusty beneath, with apex and upper border of fore wings, and all of hind wings dusted with white scales. The black spots are repeated on inner portion of wing distinctly, but are indistinct or absent on the outer portion. Expands 1.30 to 1.60. Habitat, Southern Arizona.

Cleis is a dimorphic form, paler in general coloration on both surfaces.

GENUS XLVII.

EURYGONA. VARIED BUTTERFLIES.

Size, medium. Color, dark, variegated with bright tints. Hind wings, elongated, Fore wings, large and tri-

angular. Antennae, very slender, nearly two thirds as long as the fore wing, club enlarging gradually.

320. EURYGONA ABREAS EDW.

RED-BANDED BUTTERFLY.

Dark brown above, reddish on central cell of fore wings to base, and on the basal half of hind wing; there is a band of red crossing both wings, near middle, and between this and the outer margin, is a pale brown stripe. Fore wings and upper half of hind wings, edged with brown; the lower half of hind wings, red edged, and along this edging is a series of white crescents, the upper of which is surrounded by a large black spot. Reddish gray beneath, with the markings repeated. Expands 1.00. Habitat, Southern Arizona.

GENUS XLVIII. CALEPHELIS. PIGMIES.

Size, small. Colors bright, spotted with black and metallic colors. Fore wings triangular, hind wings oval. Antennae, nearly as long as the body, with the club enlarging gradually. Type *C. caenius*. (Plate IX, 5.)

321. CALEPHELIS CAENIUS LINN.

GOLDEN PIGMY.

Golden orange on both surfaces, darker above, with both wings crossed with about six bands of black dots. There is a sub-marginal band of shining black-lead color, within which is a band of spots of the same color. Both surfaces marked alike. Expands .75 to .85. Habitat, Southern States. Occurs in Florida from April until November.

322. CALEPHELIS BOREALIS GR-ROB.

NORTHERN PIGMY.

Larger than *C. caenius*, differs in being browner above, with only four rows of black spots. Rather yellower beneath, than in the type, and the spots are less distinct, but the lead colored lines are more distinct. Expands 1.00 to 1.20. Habitat, New York, New Jersey, West Virginia, Michigan, and Illinois.

323. *CALEPHELIS AUSTRALIS* EDW.

SOUTHERN PIGMY.

Similar to *C. borealis*, but differs in having the outer margin of fore wings, much bent outward in the middle. in not being as red above, and the black lead lines are not as heavy. Expands 1.00 to 1.05. Habitat, Southern Texas and Arizona.

324. *CALEPHELIS NEMESIS* EDW.

AVENGING PIGMY.

Pale brown above, darker on basal half. Both wings crossed by two lines of lead colored dots, within which are two lines of black dots, one central, the other basal. Expands, 1.00. Habitat, Arizona and Southern California.

GENUS XLIX. *EUMENIA*. SLUGGISH BUTTERFLIES.

Size, medium. Colors, black, relieved with orange and greenish spots. Wings, short and rounded. Central cell, closed. Antennae short, not as long as body with the club enlarging very gradually from the middle, then narrowing to the tip. Type *E. atala*. (Plate, IX, 6.)

325. *EUMENIA ATALA* POEY.

GREEN-SPOTIED SLUGGARD.

Black above, with fore wings overwashed with green on basal three-fourths. Hind wings, with a little green on either side of the central vein, and with a broad border of bluish-green crescents. Beneath, black no markings on fore wings; on hind wings three rows of bluish-green spots; on outer half of the wing, and on lower margin is an oblong reddish orange patch. Expands 1.60 to 1.80. Habitat, Extreme Southern Florida, near Biscayne Bay. Occurs throughout the year.

Family IV. *LYCAENIDAE*. The Little Butterflies.

SIZE, SMALL. LEGS, SIX. ANTENNAE, STRAIGHT. HIND WINGS, ROUNDED.

GENUS L. THECLA. HAIR-STREAKS.

Small, colors usually dark above, lighter below, ornamented with small spots of brighter color along outer border of hind wings. Fore wings, triangular. Hind wings, rounded and often tailed. There is usually an oval sex mark on fore wing of male. Type, *T. poeas*. (Plate, IX. 7.)

323. THECLA GRUNUS Bd.

BOSDUVAL'S HAIR-STREAK.

Size, large. Yellowish-brown above (Females more yellow in center of wing). Beneath, yellowish white, with a central band of pale black. On outer margin of hind wings are some pale crescents. Expands 1.50. Habitat, Northern and Southern Nevada.

327. THECLA CRYALUS Edw.

COLORADO HAIR-STREAK.

Size, large. One tail. Purple above, with outer margin of both wings, and upper margin of hind pair broadly edged with black, and more narrowly on upper margin of hind pair, depending from this in the middle, is a large black spot. In the marginal band on the lower side of fore wings are four yellowish spots, and in the angle is another triangular spot. On hind wings are two oval yellowish spots, with black pupils. Tail, long, black and white tipped. Lower side brown, faintly tinged with purplish. Fore wings, with a sub-marginal band of black spots, preceded by a white line, and the yellowish spots are repeated. There is a second line of bark brown crossing wing, white edged on both sides. Hind wings, with a marginal series of yellow spots, with one on inner angle, black, and one or two in middle of wing have black pupils, but those towards upper margin are pale. Outside these spots, is a black line. Crossing middle of wing is a brownish line, white bordered. There is a line in cell, and a dark brown stripe extending from upper border to middle of wing. Expands 1.50 to 1.70. Habitat, Southern Colorado.

327a. THECLA CRYALUS CITIMA H. Edw. Differs from the type, *T. crysalus*, in having the yellowish spots above very faintly indicated. The color beneath is more ashy, and the markings are less prominent, often nearly wanting. Habitat, Mt. Nemo, Utah, and South Western Colorado.

328. *THECLA HALESUS* CRAM.

BLUE HAIR-STREAK.

Size, large. Male, tails, two. Above, bright glossy black on outer fourth of both wings, excepting toward inner angle of hind pair, where the border becomes narrower, and there is a black border along lower margin. Sex mark, black. Hind wings with tails black, before the larger is a blue crescent, with a smaller one on either side. Beneath, blackish brown, with a red spot at base of fore wings, and two more at base of hind pair, and the fore wings have a dash of blue along central vein. Hind wings, have the blue crescents repeated, with three others before them in a black field. Female has about half the wings dull black above and lacks the blue on under side of fore wings. Expands, 1.40 to 1.60. Habitat, Gulf States, Illinois, Nevada, California, and Arizona.

Fig. 39.



a, upper side, fore wing, *Chionobas uhleri*; b, same, *Libythea carinenta*; c, same, *Lemonias nais*; d, same, *L. palmeri*; e, lower side, hind wing, *Thecla favonius*.

329. *THECEA M-ALBUM* Bd-LEC.

WHITE M HAIR-STREAK.

Size, large. Tails, two. Above rich, glossy, violet blue, quite broadly bordered outer on margin, more narrowly on upper, with black. On hind wings above tails, is a reddish orange spot, preceded by white at inner angle. Beneath, brownish gray; on fore wings is a single white line on outer third, bent inward on the second branch of middle vein. This line is continued across the hind wing and forms a rude W over the tails. Between this and the margin is a second white crescent line, the whole edged outwardly with black, broken above the first tail by an orange patch which extends inward to the first line. Outer margin of wing white, with a large blue patch before second tail. Tails black, white tipped. Expands 1.30 to 1.40. Habitat, Gulf States, Virginia, Pennsylvania, and Ohio.

330. *THECLA FAVONIUS* SM-ABB.

SOUTHERN HAIR-STREAK.

Dark brown, above, sex mark blackish. On outer margin of hind wings near inner angle, is a bluish line, above a narrow black border,

above which are two round black spots, above that, between the two tails, is a reddish orange crescent, on either side of which are two bluish spots, below the innermost of which is a second orange spot. Beneath, silvery brown, with a band on outer third of both wings, white, not quite crossing fore wing, and black-lined inwardly. The white line becomes double near inner angle of hind wings, and forms a rude W, black-lined below, Fig; 40, a. It is interrupted over the space between the tails by an orange spot, which extends into a point towards the upper margin; The inner angle is a second orange spot and both have a black spot below them. Beneath this, a blue patch spotted with black. There are indications of a second band of blackish between the common band and the margin. Expands 1.00 to 1.30. Habitat, South Carolina, and the Gulf States.

331. THECLA AUTOLYCUS EDW.

TEXAS STREAKED BUTTERFLY.

Tails, two. Brown above, with a large patch of ochraceous in outer half of fore wings, sometimes extending quite across the wing. Hind wings with a spot of same between the tails, with a small spot of orange on inner angle, and there is usually a black spot between the tails. Beneath, silvery brown, with two more or less broken lines of white on both wings, edged with black. The inner line of hind wings forms a shallow W. There is a series of orange crescents outside the black and white line, and a black spot between the tails, also one at inner angle, the space between them being blue. Expands 1.05 to 1.10. Found in Texas and Missouri.

332. THECLA HUMULI HARR.

GRAY HAIR-STREAK.

Size, medium. Tails, two. Dark slaty blue above. Sex marks, dusky patches. Fringes, white. On outer border of hind wings is a black line, above it is a white line, extending from inner angle to middle of wing. Above this, two black spots, the one between tails with an orange crescent over it, and on either side of the crescent are two white spots, one behind the other. On inner angle, is a small orange spot. Pale slaty blue beneath; partly crossing fore wing, and wholly crossing hind wing, is a white line, black edged within; on hind wing this line forms a rude W over tails, Fig. 40, a. On fore wings, nearer margin a dusky line and on hind pair a line of black spots, white edged outwardly and inwardly. Between tails, and on inner angle, are two black spots, surmounted by a reddish spot. Marginal line, repeated. Expands 1.15.

1.35. Habitat, Atlantic States, Mississippi Valley, Montana, and California. Occurs from May until August.

333. *THECLA MELINUS* Bd.

ALLIED HAIR-STREAK.

Quite similar to *T. humuli* in general coloration, differing in the absence only of the red edging to the black line, crossing both wings. Expands 1.25 to 1.30. Habitat, California, Nevada, and Arizona.

333a. *THECLA MELINUS PUDICA*, differs from typical *T. melinus* in being much paler, with markings very faint, they being quite obliterated on fore wing. Size also smaller. Expands .90. Found in Arizona.

334. *THECLA ALCESTIS* Edw.

TAWNY HAIR-STREAK.

Size, medium. Tails, two, both long. Pale yellowish brown, unspotted. Grayish, beneath. Both wings have a sub-marginal line of white, black edged, broken by the veinings on fore wings, and on upper half of hind pair. Then forming crescents in middle, and ending at inner angle in a straight line. It is edged with orange outwardly, then between this edging and the margin, is a clear grayish space. At inner angle is a round black spot, with an orange stripe, next this is a large black spot, covered with bluish scales; beyond this is a round black spot. Both wings are crossed by a white line, which is straight to middle of hind wing then zigzag. On middle of wing is a white stripe. Expands 1.30. Habitat, Texas and Mt. Graham, Arizona.

335. *THECLA ACADICA* Edw.

PALE HAIR-STREAK.

Size, large. One tail, long, the other rudimentary. Pale smoky brown above. Sex mark, narrow, and ashy in color. There is a narrow sub-marginal line of black on both wings. On hind pair, there is a spot of orange between the tails, beneath which is a black line, and below this a second black line, extending to the inner angle, where there is a black spot. Very pale slate beneath, with bronzy reflections, margined as above. On fore wings there is a line of black spots, orange edged without, white edged within, then a line of white-ringed black spots, and in the middle of the wing is a short line of black, white-ringed, and having a lighter center. On hind wings these markings are repeated, excepting that the red spots, along outer line of black, are larger. The tail is black, and between it and the black spot on inner angle is a

blue spot; above the black spot is a dot of white, and the red spot above this is large and triangular in form. The line in middle of wing is longer than that on fore pair and lacks the black center. Expands 1.20 to 1.35. Habitat, Ontario, Quebec, Northern States, Montana, Nevada, and Arizona.

336. *THECLA CALIFORNICA* Edw.

CALIFORNIAN HAIR-STREAK.

Pale brown above, near inner angle of fore wing are two faint orange spots, and near inner angle of hind pair are three orange crescents. Beneath, gray tinged with reddish. On hind wings is a straight line of black, white edged. On fore wings, beyond cell, is a band of seven larger black spots, all edged without with white. There is a marginal row of orange crescents, small and pale toward upper margin, but larger and deeper colored toward inner angle. The one at angle extends up the margin and encloses a pale blue spot, which is sprinkled with white atoms; all of the crescents are surrounded by black, which is white edged above. Expands 1.30. Found in Nevada and California to Vancouver's Island.

THECLA CALIFORNICA CYGNAS, Edw. is similar, but paler, and the spottings are not as distinct.

337. *THECLA DRYOPE* Edw.

DRYOPE HAIR-STREAK.

Pale brown above, broadly edged with yellowish brown on outer margin and apex of fore wings, and more narrowly on hind pair, while there is a yellowish sub-marginal band on hind wings. Yellowish gray beneath, and there is a central row of small rounded black spots, white edged on both wings, and a series of spots outside these, pale on fore wings, but more distinct on hind pair. Spot on inner angle, and the third and fourth, show a few orange scales, and the spot next the inner angle shows a trace of bluish. Expands 1.20. Found in California and Utah.

338. *THECLA EDWARDSII* SAUND.

EDWARD'S HAIR-STREAK.

Size, medium. Tails, two, outer, short, inner, long and twisted. Dark brown above, with two alternate black and white lines between the tail and the inner angle, which has a black dot on it, and directly over the tail is a rather indistinct spot of reddish. The sex mark is pale and oval in form. Pale smoky brown beneath. There is a black marginal band to both wings, and then a white one. Inside this is a band

of black spots, outside of which, and resting against them, is a line of quite pale reddish spots, which are brightest behind. This is edged with white internally. Inside this is a band of dusky spots, each of which is entirely surrounded with white. On both wings, in central cell, are two short, white lines, the outside of which is dusky. Between the outer and inner tail is a black dot, above which is a distinct crescent of red, and between these and the inner angle is a blue field. The spot at angle is black, above this a white dot, then a streak of red. Expands 1.10 to 1.40. Habitat, Ontario, Quebec; Maine, and Massachusetts west to Nebraska and Colorado.

339. THECLA WITTFELDII EDW.

WITTFELD'S HAIR-STREAK.

Size, large. Tails, two. Inner, long, outer, short. Dark brown above. Sex mark, oval. Inner half of outer margin of hind wings is bordered with metallic blue, and there is a large orange spot over a black marginal spot near inner angle. Dark brown above, narrowly margined with white on both wings. Upper margin of fore wing near base, red. Both wings are crossed by two lines of white spots near outer margin, each edged with black on the outer side, and in middle of fore wings there is more or less orange outside the black. On hind wings there is a bluish spot near inner angle on a brown ground, next this are three orange spots diminishing in size, the last often obsolete, the largest has a black patch between it and the margin, inner angle, black, surmounted by a red and black streak. In central cell of both wings, are two short white lines. Expands 1.50 to 1.70. Habitat, Indian River, Florida.

340. THECLA CALANUS HUB.

BANDED HAIR-STREAK.

Size, medium. Tails, two, outer, long; inner, short. Smoky brown above, with no markings excepting the usual oval spot of male, and a black line above tails on hind wings. Beneath, much paler than above, with a narrow marginal line of black on both wings, inside of which is a black line, inside this a bank of black spots, white lined internally, then a pale dusky band, edged with white. This band is broken into spots on the hind wings, each of which is white-ringed, the lowermost being bluish-ringed. In central cells are two lines, white on outer and inner sides. Spot on inner angle of hind wings, black, with an oblique bluish line, at the end of which is a small spot of red, above this are two oblique lines of black, above the lower and upper is a bluish line

There is a large blue field between the black spot and the tail, next this is a black dot, on which rests a red crescent, and beside this is another smaller spot and crescent of the same color. Expands 1.12 to 1.43. Habitat, Atlantic and Western States, Colorado, Texas, New Mexico, Ontario and Quebec. Occurs in July in the north.

341. *THECLA ONTARIO* EDW.

ONTARIO HAIR-STREAK.

Size, medium. There is one tail. Dusky brown above, oval sex mark paler in color. On hind wings, near inner angle is a small, reddish, crescent-shaped spot, and beneath it are two alternate lines of black and white. Pale brown beneath, fringed with lighter. On fore wings are two dusky bands, marginal and sub-marginal, inside these is a shorter, zigzag band of white, lined internally with black. On hind wings are two bands, black and white and inside these near middle of wing are two bands, the outer of which is black externally and white internally, and on the inner the reverse is the case. At inner angle is a small black spot above which is a longitudinal red line, next to the dot is a blue spot, reaching to the tail, and above it are two lines of bluish, next to this is black dot, and above it a white crescent, to which is joined a second. Expands 1.10 to 1.15. Habitat, Ontario, New England, and New York.

342. *THECLA STRIGOSA* HARR.

WHITE-BORDERED HAIR-STREAK.

Size, medium. Tails, two, the inner twice as long as the outer. Dark brown above, fringed with whitish, no markings on fore wings excepting oval spot. There is a black spot on inner angle of hind wings that encloses a reddish dot (there are three in the female) and there is a black line above the tails which are also black, white-edged. Reddish brown, beneath, much paler than above, white fringed, and this is followed on both wings by a dusky line. On fore wings is an indistinct band of dusky, followed by a band of black crescents, white-lined interiorly, resting on pale reddish spots externally. Within this, near apex is a short, white and black line, reaching through the central cell, then another black and white line reaching to the lower branch of the middle vein, followed by a white and black one, crossing wing to the lowermost cell, and inside this is an interrupted band, also black and white, thus, counting from the apex of the wing, there are five white and black lines, the outermost of which has the black on the outside, the rest on the inner. Hind wings have also five black and white lines. The first has the black outside and crosses the wing, the second reaches through

branches of middle vein, the next two reach the branches of the middle vein. The fifth crosses the wing while there is a sixth, short line, reaching from the lower margin of the wing to the middle vein. The first, fifth, and sixth lines are bent upward on the lower border of the wing at quite an acute angle. The spaces between the fifth and sixth lines are reddish and some between the third and fourth are reddish, and there is a line of dots outside the outermost line also reddish. Between the tails is a black dot, below which is a line of brownish, then a blue field and next it in the inner angle, is a black spot, on the upper portion of which rests a white dot, and above this is a reddish, oblique line. The female has two or three orange spots over the tails. Expands 1.10 to 1.20. Habitat, Atlantic States, Mississippi Valley, Montana, Colorado, Ontario, and Quebec. Occurs in July.

343. THECLA ITYS EDW.

ITYS HAIR-STREAK.

Size, medium. One tail. Upper side, brown. Sex spot, oval. Hind wings with an indistinct spot near inner angle, and the space between the tail and inner angle is white-edged. Tail, black, white-tipped. Lower side, pale grayish brown. The fore wings have a sub-marginal row of indistinct spots, and at end of cell there are a few round black spots, white-edged. In middle of wing is a pale brown streak. On hind wings is a complete row of black dots on a white ground. On inner angle a velvety black patch, above which is an indistinct orange spot, surmounted by black. In the next interspace is a bluish spot with black scales above it, then a small orange spot with black above and below it. At end of cell is a row of black dots, white-ringed, with a brown streak in the center of the wing. The female has a clear orange spot near inner angle of hind wing above. Expands 1.30. Habitat, Arizona.

344. THECLA SPADIX EDW.

TEHACHEPI HAIR-STREAK.

Allied to *T. putnami*. Dull gray above, darkest at base, with a large chestnut patch on fore wings, and with no other markings. Paler with no markings on fore wings, beneath. On hind wings there is a very faint band near middle of wing, irregularly broken, and a faint spot in central cell. The marginal band is very faint. The crescents on inner angle are dull brown and enclose three patches of black and white scales. Expands 1.00. Habitat, Southern California.

345. THECLA NELSONI Bd.

NELSON'S HAIR-STREAK.

Size, small. One short tail. Yellowish brown above, without markings, fringed with white. Beneath, on fore wings duller, there is a sub-marginal white band, black edged interiorly. Hind wings, chestnut with the black and white band continued. Near inner angle are two or three whitish crescents surmounted by faint orange spots. Expands 1.00. Habitat, Big Trees and Mendicino, California.

345a. THECLA NELSONI EXOLETA H. Edw. Similar to the typical *T. nelsoni*, but paler with the marginal crescents very indistinct. The central band on hind wings and the sub-marginal band on fore wings are wanting.

345b. THECLA NELSONI MUIVII H. Edw. Smaller than the type and darker with the fringes of the same color as the wings, not white. The marginal crescents on hind wing are slate color.

346. THECLA ADENOSTOMATIS H. Edw.

GRAY HAIR-STRAK.

Size, medium. Tails, two. Slaty brown above, unspotted. Slaty gray beneath, faintly tinged with greenish on fore wings. There is an unbroken wavy line crossing fore wing, white edged inwardly and with dark slate outwardly, and six very faint sub-marginal patches of black. Hind wings, dark slate at base somewhat mottled with white along lower margin. There is a white central band, edged inwardly with black and white. Then there is a sub-marginal series of five or six crescents black-edged inwardly, white-edged outwardly. Expands 1.15 to 1.25. Found in Northern and Southern California.

347. THECLA TACITA H. Edw.

MENDICINO HAIR-STREAK.

Size, small. Tails, two, but small. Pale plumbeous above, a little darker at outer margin, sex patch, and along veinings distinctly marked with a darker shade. Near inner angle of hind wing is a small, faint spot of ocherous. Lower side, paler, with a very faint sub-marginal line of blackish crescents, and a central line of spots equally faint. There is a black spot on the fringe at extreme point of inner angle of hind wing followed by a patch of bluish scales, and a very pale yellowish triangular spot, narrowly edged with black. All of the markings are indistinct. Expands 1.00. Habitat, Mt. Shasta, California.

348. *THECLA TETRA* BEHR.

TETRA HAIR-STREAK.

Size, medium. One tail. Upper side, pale brown, and there is an orange spot near inner angle. Paler, beneath, both wings have a central row of whitish crescents. On hind wing, in addition to this, is a sub-marginal row of small black crescents, edged inwardly with a few scales of whitish; the one preceding the tail, rests on an orange patch, and the second from the angle upon a faint blue patch. Expands 1.20. Found in California.

349. *THECLA CHALCIS* BEHR.

CHESTNUT HAIR-STREAK.

Size, medium. One tail. Bright reddish brown above. Reddish brown beneath, grayish next base. Both wings have a sub-marginal row of very pale dots, the three next to the inner angle being the clearest, the first from angle surmounting a faint gray space. Across the center of wing is a row of faint brown spots, indistinctly edged with whitish. Expands 1.20. Found in California and Utah.

350. *THECLA SAEPIUM* Bd.

SEPIA HAIR-STREAK.

Reddish brown above, unspotted. Brown beneath, paler on outer portion of wings, with a narrow, white wavy line crossing wings; outside this, is a paler line, blending near inner angle of hind wing with a grayish blue patch, which is preceded by a small black crescent. Expands 1.25. Found in California, Washington, Utah, Nevada, and Colorado.

350a. *THECLA SAEPIUM FULVESCENS* H. Edw. Smaller than typical *T. saepium*, and paler in color, being golden brown instead of chestnut, with fringes white. Fainter in color beneath, with markings less prominent, and with the sub-marginal band always more distinctly edged with white.

351. *THECLA PUTNAMI* H. Edw.

PUTNAM'S BUTTERFLY.

Size, medium. Tails, two. Pale yellowish brown above, darker on upper margin and at base of both wings, with a series of four indistinct black crescents, edged beneath with white. Spot at inner angle orange, tinged with golden yellow. Grayish white beneath. Fore wings with a black crescent in central cell, and six white-ringed black spots in center of wing. Near inner angle are four faint black spots. Hind wings with a black crescent in central cell, and seven white-ringed black

spots in center of wing. Spots on margin faint, that on inner angle is dusky, faintly edged with orange; the second and third are blackish, surmounted with orange. Expands 1.05 to 1.25. Found at Spring Lake Utah.

352. THECLA SPINETORUM Bd.

ORANGE HAIR-STREAK.

Size, rather small. One tail. Reddish orange above, chestnut beneath, both wings crossed by a white line. There is a very faint line of spots on outer margin of hind wings, the first two from angle are distinct; of these the first is bordered with a few white scales, the second is blue on an orange ground. The central band is a series of round black spots, crossing both wings. Expands 1.10. Found on Mt. Shasta, California.

Fig. 40.



Illustrating the genus *Thecla*, lower side, hind wing; a, *humuli*; b, *acadiana*; c, *edwardell*; d, *calanus*; e, *strigosa*.

353. THECLA AURETORUM Bd.

GOLDEN HAIR-STREAK.

Wings, (on both surfaces,) reddish brown; on inner angle of hind pair above is an indistinct crescent of orange. On hind wings beneath is an obscure wavy line, and on inner angle of hind pair a black crescent and two spots of orange. Found in California.

354. THECLA SYLVINUS Bd.

WOODLAND HAIR-STREAK.

Reddish brown above; ashy beneath with a dot in center of wing and a double line of black dots crossing wings. On inner angle of hind pair is an ashy blue spot and next it a clear rufous crescent. Found in California. Neither this species, nor the one preceding have been identified by American collectors.

355. THECLA SIVA Edw.

SIVA HAIR-STREAK

Allied to *T. smilacis*, with two tails and a similar color above, but the ground color is darker, being more chestnut. Grayish beneath,

washed with pale metallic green most densely on upper margin and outer border of fore wings. There is a pure white line crossing both wings consisting of nearly confluent spots, bent on hind wing much as in *T. smilacis*. There is a gray patch near inner angle of hind wing and above it is a black spot on rusty ground. On either side of this and the next patch is a black crescent. Spot on angle black. Expands 1.00. Found in Arizona.

356. *THECLA CASTALIS* EDW.

TEXAS HAIR-STREAK.

Similar to *T. siva*, differing in being paler, the band beneath is more irregular, the spottings being more separated, and there are two conspicuous white spots near the base of hind wings. Expands 1.00. Found in Texas.

357. *THECLA SMILACIS* Bd-LEC.

GREEN HAIR-STREAK.

Size, rather small. Tails, two. Bronzy yellow above, with both wings bordered all around, excepting on lower margin, with brown. Beneath, green, with purplish reflections. Outer margins of both wings lined with purplish brown, and a band of same color crosses both wings, on outer third; this line is white-edged outwardly, is straight on fore wings, but is bent outward in the middle of the hind wing, Fig. 41, b. On hind wing, within central cell, is a short, purplish line, and another above it, both white edged on the basal side. There is also a sub-marginal band of four small crescents, starting from upper margin. Expands, 1.00 to 1.10. Habitat, Atlantic and Southern States, Northwestern Texas, and Point Pelee, Ontario.

358. *THECLA ACIS* Duz.

KEY WEST HAIR-STREAK.

Size, small. Tails, two. Dark brown above, with a bright red spot near inner angle of hind wing. Lead color beneath. A black, white-edged line crosses both wings and there are traces of another line outside of this. Between base of the tails is an orange patch, then nearest inner angle a patch of blue and black and at angle a spot of red and black. Expands, 1.00. Habitat, Key West.

359. THECLA POEAS DUB.

RED-BANDED HAIR-STREAK.

Plate IX, 5.

Size, small. Tails, two. Pale brown above, glossed with bright blue, especially on hind wings. Pale yellowish brown beneath, with a bright orange vermillion band crossing both wings, white-edged on the outside. This band is indented above the tails with a V shaped patch of pale orange. At inner angle is a dot of black with a minute white spot over it; between this dot and the base of the inner, longer tail is a bluish field, then a sub-marginal series of pale brown spots growing indistinct toward the upper margin of the wing, while below them is a marginal line of white and black. Expands 1.00. Habitat, Southern States, West Virginia, Kentucky, and Indiana.

360. THECLA COLUMELLA FRB.

MODEST HAIR STREAK.

Size, small. There is one tail only. Grayish brown above, with two black spots near inner angle of hind wing. Grayish beneath, with lilac reflections; both wings with a bar across end of central cell, outside of which is a curved row of black spots, bordered with white outwardly, and outside of this is a double row of white crescents, faintly defined on fore wings, more distinct on hind pair, and there is a dusky shade between the two rows. At inner angle of hind wing is a black spot, sprinkled with a little orange, then next it a blue patch, and beyond this an orange patch with black outside it. Expands 1.00. Found at Key West, Florida; Texas, and occasionally New York.

361. THECLA CLYTIE EDW.

CLYTIE HAIR-STREAK.

Size, small. Tails, two. Above light blue, of the same shade as in *Lycaena pseudargiolus* with upper margin of fore wings, blackish; on outer margin of hind wings is a black line preceded by a white one, and on that near outer angle is an orange line. Near inner angle is a black spot and at the angle is an orange spot. Grayish white beneath, darkest on outer margin; both wings are edged with a fine red line, and are crossed a little beyond the middle by a row of elongated red spots, white-edged, and on the inner margin of the hind wings takes the form of a W. In central cell of fore wings is a red bar, and on hind wings a red spot on upper margin, near base, and two smaller ones in a line with it in the middle of basal portion. On fore wings is a sub-marginal row of pale crescents. On hind wings, between bases of tails, is a black

triangle, upon a large orange spot, and at the angle is a black spot surmounted by orange; outer tail, white, inner, black, fringed with white. Expands .80. Found at San Antonio, Texas, and in Arizona.

362. *THECLA LEDA* EDW.

LEDA BUTTERFLY.

Similar to *T. clytie*, but differs in being violet blue above, the edging of the wings is brown, not red, and both tails are black. Expands .85. Habitat, Arizona.

363. *THECLA INES* EDW.

INES BUTTERFLY.

Size, small. Tails, two, inner, long. Lavender blue above, brown on apex of fore wings. On hind wings, between bases of tails, is a round black spot. Tails, black. Yellowish brown beneath, somewhat clouded on hind wings. On fore wings is a sub-marginal row of pale brown crescents. Within these is a nearly straight black line, white-edged outwardly, and there is a straight black bar in middle of wing. The hind wings have an irregular line across outer portion forming a W near the inner angle. There is a brown patch at the angle and a faint spot between the base of the tails. Expands .80 to .85.

364. *THECLA AUGUSTUS* KIRBY.

BROWN BUTTERFLY.

Size, small. Tails, absent. Brown above, female, with brownish orange spot on inner angle of hind wing. Also brown beneath, overwashed with greenish on apex of fore wings and with reddish on hind pair. There is a sub-marginal line of black points on both wings, followed by a black band which on hind wings is much bent, and inside it on this wing the base is wholly brown, reddish tinted. Expands, .85 to 1.10. Habitat, Northern America, Ontario, Quebec, and Eastern States.

365. *THECLA IROIDES* BD.

PLAIN STREAK.

Size, small. No tails. Upper side brown, unspotted. Lower side also brown, reddish on hind wings, with a row of blackish dots on outer portion. Expands 1.00. Found from British Columbia to Arizona.

366. THECLA IRUS Godt.

PEARLY BUTTERFLY.

Similar to *T. augustus*, but differs in having more prominent teeth to the hind wing, Fig. 41, c, and the dark line crossing wings is white bordered on the outside, and the outer half of hind wing is overwashed with whitish. Expands 1.00 to 1.25. Habitat, Atlantic and Western States. Occurs in May.

367. THECLA MOSSII, H. Edw.

MOSS' BUTTERFLY.

Differs from the type in having no teeth to hind wings, in being brighter chestnut brown above, with fringes wholly white, not alternately white and brown, and in being more reddish brown beneath. The marginal spots are large, distinct, and bright chestnut brown, six in number, each surmounted by a small black crescent. Basal portion of the hind wing dark brown. Habitat, Vancouver's Island.

368. THECLA HENRICI Gr-Rob

HENRY'S BUTTERFLY.

Similar to *T. iris* but differs in having the sex mark on fore wings only twice as long as wide, not three times as in *iris*. The outer portion of hind wing is rusty colored and the teeth are shorter and the first beyond the inner angle do not curve outward. Expands .95 to 1.10. Found in West Virginia.

369. THECLA NIPHON Hub.

BLACK AND WHITE BUTTERFLY.

Similar to *T. irus*, but differs in having the line on fore wing bent outward in the middle. On hind wing there is a band of rusty checkers crossing outer portion in a brown field, and the basal portion of wing is checkered with rusty, and crossed by a black line. Females are rusty in middle of wings above, leaving the border and base only brown. Expands 1.00 to 1.25. Found in Atlantic and Western States, Colorado, Ontario, Quebec, and Nova Scotia. Occurs in May.

370. THECLA AFFINIS Edw.

GREEN HAIR-STREAK.

Size, small. No tails. Glossy reddish brown, with upper and outer margin of fore wings blackish, fringed with white. Beneath, uniform bright green, excepting on lower border of fore wing, where it is pale brownish gray. No spots on either surface. Expands about 1.00. Found in Utah.

371. THECLA BEHRII Edw.

COPPERY HAIR-STREAK.

Size, small. Tails, two. Bright shining copperish yellow above, broadly bordered with blackish on upper margin of fore wings, and narrowly on outer border of both pairs. Slaty gray beneath, with the outer margin, lined with black, that is succeeded, internally, by a white line. On fore wings is a sub-marginal band of orange spots, edged internally with white in middle. There is a white band, black-edged inwardly. On hind wings is a sub-marginal band of black arrow-shaped points, of varying sizes, the sixth from upper angle being largest, the seventh is nearest outer margin, and is surmounted by a large red spot, that is edged by a black crescent. Beneath the eight black spot is a grayish patch, and there is a black spot at inner angle. Crossing wing is an irregular wavy white line, black-edged inside. Expands 1.00 to 1.25. Found in California, Nevada, and Colorado.

372. THECLA FOTIS STR.

FOTIS BUTTERFLY.

Size and form of *T. augustus*, but differs from it in being grayish slate on both surfaces, and there is a line of sub-marginal white spots on under surface of hind wings. Found in Arizona.

373. THECLA ERYPHON Bd.

LINED BUTTERFLY.

Size of *T. irus*, and similar above, pale beneath, with a small central patch on fore wings, and a wavy band of blackish arrow-shaped white-edged spots. On hind wings is an overwashing of purplish, and they are crossed by three black wavy lines, white-edged, the outer being composed of arrow-shaped spots. Found in California and Colorado.

374. THECLA DUMETORUM Bd.

GREENISH HAIR-STREAK.

Size, small. No tails. Greenish brown above, unspotted. Rusty beneath, on fore wings, tinged with greenish. Greenish on hind wings, with a row of black dots on outer portion. Expands 1.00. Found in California, Oregon, and Nevada.

375. *THECLA APAMA* Edw.

APAMA HAIR-STREAK.

Size, small; no tails. Above, blackish brown, fringed with ashy. Yellowish brown on fore wings below, washed with golden green over apex and upper margin. There is a line of slender black marks, white-edged on the outside, and brown-edged within, crossing from upper margin to middle of wing, and there is a similar row on hind wings, but the spots are more separated, and the upper are crescent-shaped. At inner angle the wing is white-edged over the black ring. Expands 1.10. Found in Arizona.

376. *THECLA SHERIDANII* Edw.

SHERIDAN'S HAIR-STREAK.

For description of this species see appendix.

377. *THECLA FULIGINOSA* Edw.

SOOTY HAIR-STREAK.

Size, medium. No tails. Blackish brown above, fringed with lighter. Paler beneath, with a spot near center of fore wings and a double row of rusty dots on outer portion of both wings, the outer of which on fore wing is very indistinct. Expands 1.30. Found in California, and Lake Tahoe, Nevada.

378. *THECLA LAETA* Edw.

BLUE HAIR-STREAK.

Size, small. Hind wings, square on outer margin and without tails. Above, black, with the inner two-thirds of hind wings, bright blue. (In female, this is confined to a central band on outer portion of fore wings.) Pale blue beneath, dusky at base of wings, fringed outwardly with reddish, and there is a band of reddish spots crossing fore wing, and two rows of reddish spots cross hind wings. Expands 1.05 to 1.15. Found from Maine to West Virginia, and in Atlantic City, New Jersey, Ontario, Quebec, and Arizona. Rare everywhere excepting Arizona.

379. *THECLA TITUS* Fab.

COPPER HAIR-STREAK.

Size, large. No tails. Yellowish brown above, sex mark, ashy. Beneath a little paler, with a row of black dots crossing both wings, light ringed on hind pair. There is a sub-marginal band of prominent coral red spots on hind wings, black-edged on outside and inside. At end of

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EXPLANATION OF FIGURES ON PLATE VIII.

1. *Debis portlandia*. 2. *Neonympha eurytris*. 3. *Coenonympha elko*. 4. *Erebia epipsodea*. 5. *Geirocheilus tritonia*.
6. *Hipparchia ridingsii*.

PLATE VIII,



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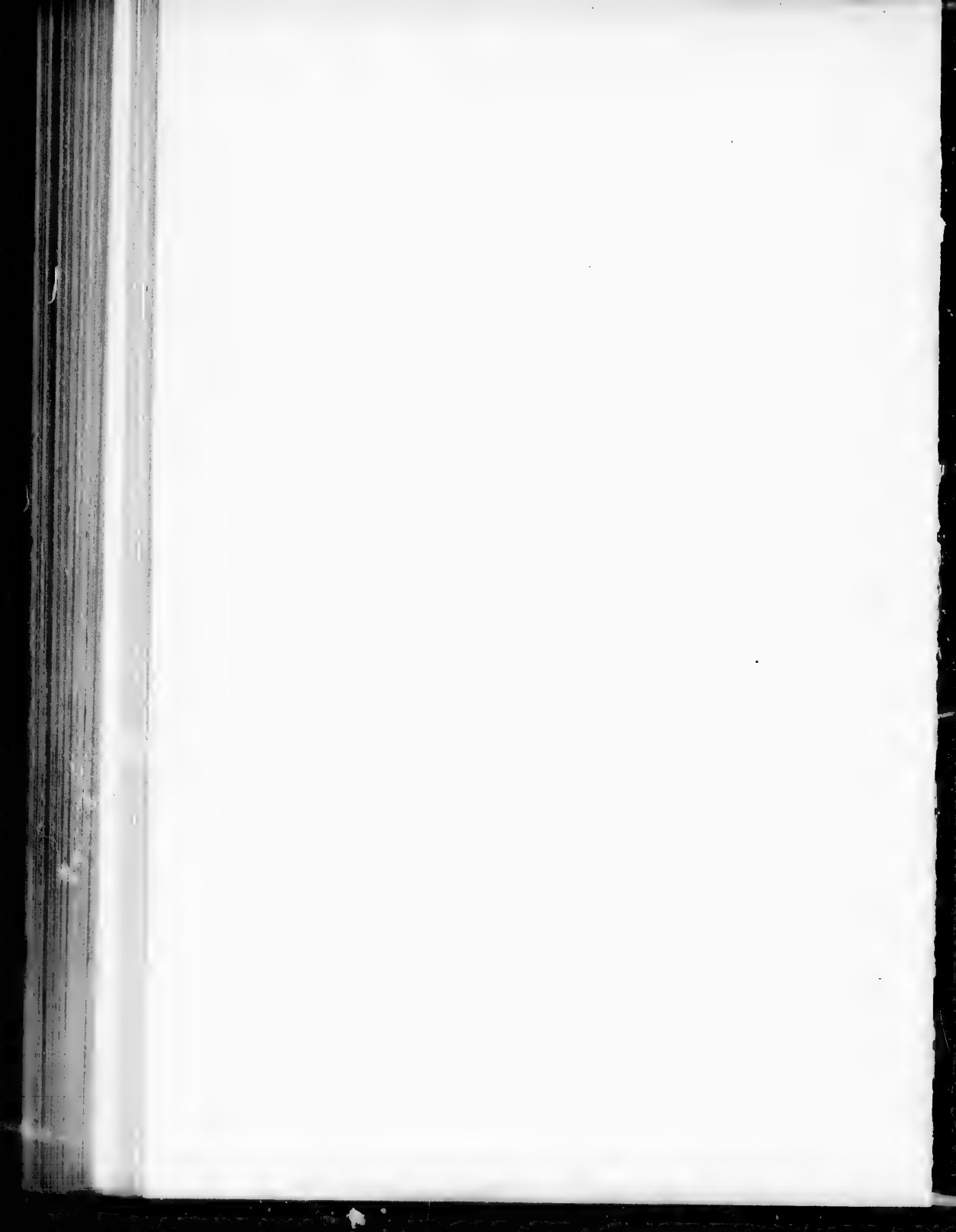
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6

North American Butterflies.

C. J. M.



central cell on both wings, are two black dots. Expands 1.15 to 1.40. Found from New England to Arizona, and in Ontario, Quebec, and Old Man's River, British America.

Fig. 51.



Illustrating the genus *Thecla*, lower side, hind wing; a, *augustus*; b, *smilacis*; c, *irus*; d, *niphon*; e, *titus*; f, antennae of same.

GENUS LI.

FENISECA. RINGED BUTTERFLIES.

Size, medium. Colors orange, marked with dusky above. Brown mottled beneath, ringed with white on hind wings. Fore wings triangular; hind wings, oval. Antennae, a little longer than half the length of fore wing. TYPE *F. TARQUINUS*. (Plate IX, 8.)

380. FENISECA TARQUINIUS.

BROWN MOTTLED BUTTERFLY.

Above pale reddish orange, with outer border of fore wing broadly margined near upper and lower border, more narrowly in the middle, and very narrowly on lower border with brown. Central cell, all but a narrow strip on lower side, a dot near its end, one below this, and an elongated line near base, dark brown. Base and upper border of hind wing, a dot at end of central cell, and a sub-marginal row of spots also brown. Lower side paler than above, rusty on outer and upper border of fore wings, and on hind pair, with seven white-ringed reddish brown spots on fore wings as in plate, and with numerous white ringed spots of a more rusty hue on hind pair. Expands 1.15 to 1.30. Found in Atlantic States. Rare in New England, Mississippi Valley, Ontario, and Quebec.

GENUS LII. CHRYSOPHANUS. COPPERS.

Size, small. Colors reddish or brownish, with either one sex or both spotted on both surfaces with darker. Differs mainly from *Thecla* in the presence of the spottings,

and in the usual absence of tails, these when present being very short. TYPE C. HYPOPHLEAS. (Plate IX, 9.)

381. CHRYSOPHANUS AROTA Bd.

TAILED COPPER.

Size, medium; one short tail. Sexes dissimilar. Above brownish red, with outer border of both wings brown. At end of central cell of fore wing is a line of brown. On hind wing near inner angle are two black crescents orange-ringed above and white lined below. Tail, orange, Fig. 52, a. Beneath, yellowish on fore wing, ashy on outer border and on hind pair. There is a double sub-marginal row of white crescents on fore wing, dusky lined on either side. Within these the wing is crossed by three rows of black spots and the line at end of cell is repeated. On hind wing are two zigzag sub-marginal bands of white, inside of which is a narrower one, dusky edged within. At end of cell are two lines, and along upper border are three white-ringed black dots. The markings on inner angle are repeated but the crescent next angle is ashy. Female differs in being pale yellowish red above, dusky bordered on outer margin of fore wing, with two rows of spots and the line at end of cell all dusky; on hind wing there is a sub-marginal row of black crescents in an ashy border, all surmounted with orange; within this is a dusky line, crossing wing, and a line at end of cell. Expands 1.10 to 1.20. Found in California.

382. CHRYSOPHANUS VIRGINENSIS Edw.

VIRGINIA'S COPPER.

Size rather large. Tail, present. Similar to *C. arota* but differs in larger size, and slightly indicated line at end of cell. Beneath, the whole surface of both wings is ashy, the sub-marginal line of crescents being confluent on fore wings and the band wider on hind pair and the spottings are larger and more distinct. The female differs from that of *arota* in having the sub-marginal line of black crescents on hind wing reduced to two or three narrow ones near inner angle, the places of the remainder being occupied by orange crescents, and the spottings are larger. Expands 1.25 to 1.30. Found in California, Nevada and Colorado.

383. *CHRYSOPHANUS HERMES* Edw.

HERMES COPPER.

Size, small. Tail, present. Pale yellowish red above. Upper and outer margin of fore wings brown. There is an irregular row of brown spots crossing wing, one spot at end of cell and another within it. On hind wings is a sub-marginal row of dusky spots, and a spot at end of cell. Beneath, pale buff with outer margin grayish, spots on fore wings repeated. On hind wings the basal two-thirds is grayish, and a marginal border is clouded with gray. There is a row of black spots crossing wing; at end of cell a line, and along upper margin three dots and three others at base. At inner angle is a black spot and near it are others of dusky. Expands .90. Found in California and Nevada.

384. *CHRYSOPHANUS XANTHOIDES* Bd.

SLATY COPPER.

Size, very large. Tail, very short, Fig. 51, b. Slaty blue with a dusky line at end of cell on both wings, and a dusky dot in cell of fore wing. There is a narrow black border to outer margin and the fringes are white. There are four black spots on outer margin of hind wing, that nearest inner angle a crescent, and large, the next, smaller, and triangular, these two are surrounded with pale orange, the next two are small. Beneath, pale buff, with a double row of dusky spots near outer margin, and a very irregular line within this, three in central cell of fore wing, two in cell of hind pair, one spot below this on both wings, and two in base of hind pair. There are two oblong crescents near inner angle. Female yellowish red, dusky bordered, within which is a line of triangular spots black, within this a dusky line running into dusky apex on fore wings. There is a line of black spots crossing fore wings, and of dusky on hind pair, one black at end of cell on fore wings, one in cell, and one below it; at end of cell, on hind wings, is a dusky line, and the base of both wings is dusky. Expands 1.40 to 1.50. Found in California.

385. *CHRYSOPHANUS EDITHIA* Mead.

EDITH'S COPPER.

Size, medium. No tails. Similar above to *C. xanthoides*. Below grayer, and there is a band of gray on the outer margin, cut by a dusky line, which begins on the lower margins, and extends out on the lower and second branch of the middle vein, thus leaving a white black-pupiled spot on inner angle. At inner edge of this gray band the white

edging is condensed into a continuous line of broad crescents; other spots as usual. Expands 1.25 to 1.30. Found at Lake Tahoe, Nevada.

386. *CHRYSOPHANUS GORGON* Bd.

GORGON COPPER.

Size, large. Tails, absent, but the inner angle of hind wings is produced into a point, Fig. 51, c. Above reddish brown with a purplish tinge, both wings bordered with dusky and fringed with white, at end of central cell on both wings is a dusky line. Yellowish ash beneath, with a marginal line on both wings of dusky, within which is a double row of small dusky spots, the inner row being crescent-shaped, and on hind wings tinged with orange on the outside. Within this, is an irregular row of black spots, also crossing both wings, a spot at end of central cell on both wings, one in cell on fore wings, and two on hind pair, with one spot on lower border of fore wing, and two on hind pair, and two at base on this wing. Expands 1.55. Found in California and Nevada.

387. *CHRYSOPHANUS THOE* Bd-LEC.

LARGE COPPER.

Size, large. No tails, and the angle of hind wing is rounded. Dull yellowish red above, with outer border of fore wings and basal three-fourths of hind pair, ashy brown. On fore wing are three black spots in central cell, one below it, and a row of spots crosses both wing. On hind wing, are three spots in cell, the outer side by side, and a sub-marginal row, all black. Beneath, yellowish red, with the ashy paler, and restricted on outer border of fore wing, to the upper portion, and there is a narrow border on hind pair. Spots above, repeated, but with additions as follows, a double sub-marginal row on fore wing, a second sub-marginal row on hind wing, and three spots on lower border, and four at base of this wing. Expands 1.50 to 1.65. Found from New England, (where it is rare,) to Nebraska, Ohio, Kansas, Colorado, Ontario, and Quebec.

388. *CHRYSOPHANUS DIONE*, Scud.

DIONE COPPER.

Similar to *C. thoe*, but differs in being brownish gray above, and grayish white beneath; the spottings are also smaller. Found from Iowa to Kansas and in Nebraska.

389. *CHRYSOPHANUS MARIPOSA* REAK.

CHOCOLATE COPPER.

Size, rather small. No tails, but the hind wings are produced into an angle on inner side. Chocolate brown above, fringed with lighter and bordered, rather narrowly, with black. There are indications of a paler crescent at inner angle. Ashy beneath, on hind wing, and on upper and outer border of fore pair; remainder of fore wings pale buff. There is an outer double line of spots, dusky on hind wings, and outwardly on fore pair, darker on inner; the spots in these lines are crescent-shaped. The second row of spots are found on fore wings, and separate, crescent-shaped, and nearly joined together on hind pair, while the line is much curved, Fig. 52, d. In central cell of fore wing, are three spots, the one at end double, and one below; three in cell of hind wings, and two above and two below. Female, reddish yellow, black bordered, spotted as is the male below but with the markings enlarged. Below, like male. Expands 1.20 to 1.30. Found in California, Colorado, Montana, and Summet, British America.

390. *CHRYSOPHANUS ZEROE* Bd.

ORANGE-BORDERED COPPER.

Size, small. Hind wing, angular. Reddish brown above, with a bar at end of cell on both wings, and a minute dot in cell, and there are a few minute dots on hind wing. Fringes lighter, then comes a narrow black border represented on hind wings by a row of hemispheres on an orange field, Fig. 52, e. Pale buff beneath, tinged with pink on basal portion of upper border of fore wing, and on outer third of both pair, and with grayish on base of hind wing. There is a narrow marginal line of dusky, a sub-marginal row of three crescents on lower portion of fore wing, a row of spots crossing fore wing; represented on hind pair by a row of minute dots, on side of which are three or four other dots; there are three spots in central cell of fore wings and one below it. Female below as in the male, but yellowish red above, heavily marked as in allied species. Expands 1.25. Found in California and Colorado.

391. *CHYSOPHANUS HELLOIDES* Bd.

SPOTTED PINK COPPER.

Similar to *C. mariposa*, but the hind wings above are darker, and the male is spotted like the female, Fig. 53, a. Beneath, the pink tinting extends over the entire surface of the hind wing, where the orange zigzag line extends further toward the upper border, and the fore wing

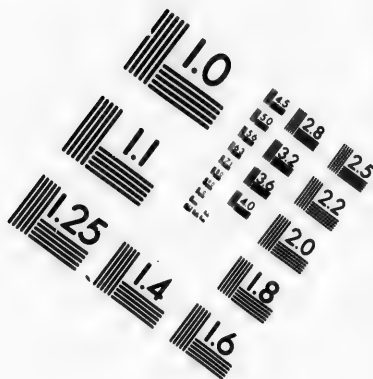
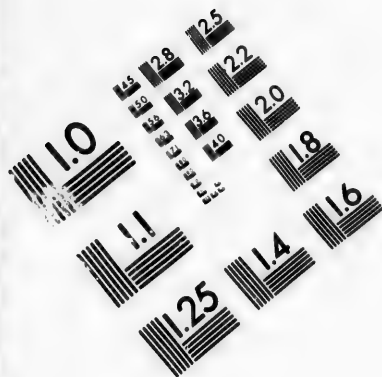
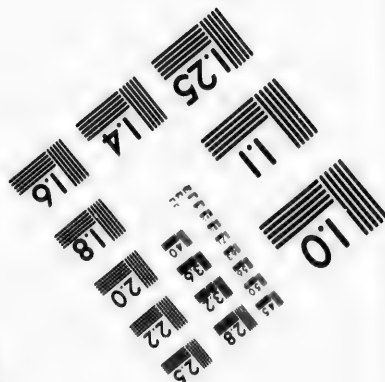
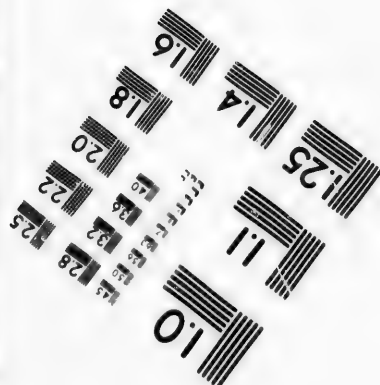
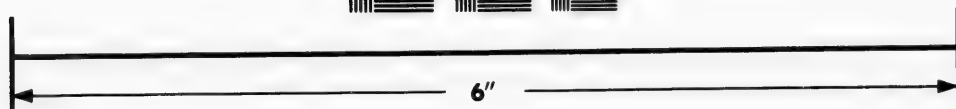
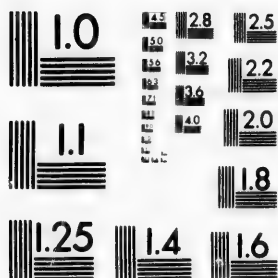


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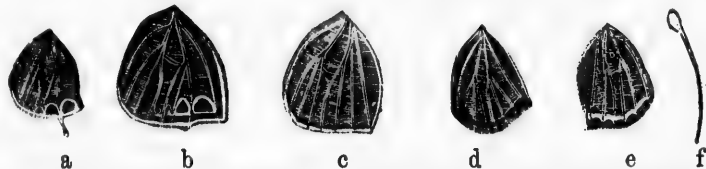
is reddish yellow. Expands 1.25 to 1.35. Found in California and Colorado.

392. CHRYSOPHANUS FLORUS Edw.

FLORUS COPPER.

Size, medium. Brown above, with a purplish reflection; the outer margin being bordered with dusky, which on hind wings is so broad as reach nearly to the first line of spots which cross both wings zigzag. There is a bar at end central cell on both wings; fore wings have two spots in cell, and one below hind pair, one in cell, connected by long lines which cross the basal portion. At inner angle is a small orange patch. Yellowish brown beneath, lighter at apex. Black spottings repeated, but enlarged, and in addition is an imperfect row, corresponding in position to the inner edge of the black border on the upper side. Hind wings, light brown, the spots repeated in dots and marks, and there is a sub-marginal series of red spots from inner angle to middle of wing. Female, dark brown with some yellow mottlings on middle of fore wings and at end of cell, spotted as usual. Expands 1.30 to 1.35. Found at Garrett's Ranch, British America.

Fig. 52.



Illustrating the genus Chrysophanus, upper side, hind wing; a, arota; b, xanthoides; c, gorgon; d, mariposa; e, zeroe; f, antennae of same.

393. CHRYSOPHANUS DORCAS Kirby.

DORCAS' BUTTERFLY.

Similar to *C. epixanthe*, but differs in having the hind wings more pointed at inner angle and an orange tinting along upper border of fore wing. Expands 1.00. Found in Kodiak, Alaska; British America, and Southern Labrador.

394. CHRYSOPHANUS EPIXANTHE Bd-Lec.

BROWN COPPER.

Size, small; no tails. Hind wings angular, but not pointed. Brown above, with strong violet reflections. There is a bar at end of cell on fore wing, a spot in cell, and one below it; on hind pair, a bar at end of

cell, sometimes a spot within it and two spots between the cell and outer margin. In the female there is a row of spots crossing both wings and this row is sometimes seen in the male, the two spots described forming part of it. There is an orange line at inner angle, enclosing two dark spots. Beneath, pale yellowish orange tinged on outer border all around with reddish, with spottings seen in female repeated in both sexes, with an extra spot in central cell of fore wing, and three dusky crescents on lower side of outer border; there is a row of red crescents on outer border of hind wings, the spots are represented by mere dots and there are two or three extra ones along upper border. Expands .85 to 1.00. Found in New England, Newfoundland, Quebec, Ontario, British America, Kansas, and Ogden City, Utah.

395. *CHRYSOPHANUS HYPOFHLEAS* Bd.

AMERICAN COPPER

PLATE IX, 8.

Size, small. Bright coppery red above on fore wings, dusky bordered on all but lower side. There is a row of black spots within the border one at end of cell, and one in it. Hind wings dusky with a narrow line at end of cell, and an elongated sub-marginal patch of coppery red, with a line of spots along outer side, and within this border in the dusky area is usually a row of dots. Beneath, paler on fore wing, spots repeated, whitish-ringed, the dusky border is replaced by ashy, and the hind wings are ashy, spotted as in Plate IX, 8. Expands 1.00 to 1.30. Found in Northern, Middle, and Western States, California, Nova Scotia, Ontario, Quebec and British America to the Pacific. Occurs from May until October.

385a. *CHRYSOPHANES HYPOFHLEAS FASCIATA* Str. is much darker with the outer row of spots so greatly enlarged as to reach the spot at end of central cell and in some cases they are fused into a wide band, Fig. 53, b. Found in Eastern Massachusetts, occurring at the same time as the type form, but is rather more abundant in the autumn.

395b. *CHRYSOPHANES HYPOFHLEAS ADRIENNE*, is as pale as the type but has the spots on the upper portion of fore wing reduced to the two cellular, there not being a trace on outer border. Found in Eastern Massachusetts.

395c. *CHRYSOPHANES HYPOPALEAS FEILDENI* Mc LACHL. differs from the type in being more brassy above, the spots are smaller, and the dark border is narrower and grayer, as is also the dark of hind wings. The sub-marginal band is pale orange; also paler beneath. Found in Arctic America.

396. *CHRYSOPHANUS CUPREUS* EDW.

FIREY COPPER.

Size, small. Hind wings, rounded as in the type, *C. hypophelas*. Above bright reddish orange with a narrow border of black. There is an outer row of spots faintly indicated by small dots and lines, a spot at end of cell in both wings and a spot in cell of fore pair. Female with spots larger. Much paler beneath, with the hind wings sprinkled with grayish. Spots repeated and white-ringed, there are two extra rows at base of fore pair and a sub-marginal row crossing both wings. Expands 1.30. Found in Shasta, California, and Oregon.

397. *CHRYSOPHANUS SNOWI* EDW.

SNOW'S COPPER.

Size, small; no tails. Coppery red above; outer margin broadly dusky bordered and upper margin of fore wings more narrowly. There is common line of black dots, and outside this on hind wings is an indistinct line; there is a long bar at end of central cell and a small dot in cell. Reddish brown beneath, on center of fore wing; the spots are repeated, a little larger, and there is an extra row of small sub-marginal spots. At end of cell are two round spots. Hind wings gray, tinged with reddish; a sub-marginal line of black spots, the one next to inner angle largest, and nearly covered with orange; the next two a little dusted with orange, and below each of these is a black point. Spot at end of cell repeated, and there are three spots in cell, and one on upper margin. Female paler and more yellowish below. Expands 1.20. Found in Colorado.

398. *HARYSOPHANUS RUBIDUS* BEHR.

BEHR'S COPPER.

Size, large. Above bright coppery red, strongly tinged with violet. Fringed with white and bordered with a narrow line of black, then by a line of paler red than that of the surface. On fore wings are faintly indicated spots which show clearly below. Hind wings unspotted on both surfaces. Beneath, pale buff, with fore wings spotted as in the Fig. 53, c. Expands from 1.10 to 1.20. Found in Oregon, Nevada, and Montana.

399 CHRYSOPHANUS SIRIUS Edw.

SIRIUS COPPER.

Similar in general coloration to *C. rubidus*, but differs in being very much more strongly tinged with violaceous above, all of the surface, excepting borders and veins, being covered, and in having a row of dots on hind wing below, one in cell and one below this. The female differs from that of *rubidus* in being brown above, with sub-marginal band of orange. Expands 1.30. Found from Montana to Arizona, and at Fort Mcleod, British America.

GENUS LIII. LYCAENA. BLUES.

Size, small. Often blue above, with or without spots, but frequently spotted beneath. Hind wings, occasionally tailed. The difference between this and the two preceding genera is very slight, and the three could, without great impropriety, constitute one genus. TYPE *L. PSEUDARGIOLUS*. (Plate X, 1)

400. LYCAENA HETERONEA Bd.

VARIED BLUE.

Size, large. Sexes, dissimilar. Above bright blue, white-fringed and black-bordered. There is an indication of a row of dusky spots crossing both wings, and within this the surface is tinged with violet. Beneath, pale buff, with a double row of spots, crescent-shaped outwardly on fore wings, and this line is paler on hind pair. There is a line at end of central cell on both wings, a spot in cell, (two on fore pair,) and one below it. Female, brown above, with spottings seen below repeated, excepting some of basal. Expands 1.40. Found in California, Utah, Nevada, and Colorado.

401. LYCAENA LYCEA Edw.

PURPLISH BLUE.

Size, medium. No tails. Sexes, not very dissimilar. Purplish blue above with a broad dusky margin on outer border to both wings. Grayish white beneath, with both wings having a row of brown dots; a second row of eight white-ringed black spots. There is a large spot at end of cell on fore wing, one fainter at end of cell on hind pair, one above it, and one on lower border. Female differs in being dusky above excepting basally, and in having the spottings indicated. Expands 1.20. Found in Colorado, Nevada, Montana, Arizona, and New Mexico.

402. *LYCAENA DAEDALUS* BEHW.

METALLIC BLUR.

Size, large; sexes, slightly different. No tails. Purplish blue above, with a metallic luster. Upper margin of fore wings next base, silvery blue, and along the inner margin of hind pair, where the surface is mostly covered with long hairs. Outer margin of fore wings, black edged; on hind pair there is a black line, inside which is a black band. On middle of outer margin is a pair of black spots and sometimes there is one on inner angle. There is a bar at end of cell on fore wing; white beneath, bluish at base of hind wings. Both pair are edged by a pale brown line, and crossed by two lines of black spots. Female differs in being rusty above, central surface obscured with dusky, brownish beneath. Expands 1.50. Found in Southern California.

403. *LYCAENA SAEPIOLUS* Bd.

GREENISH BLUE.

Size, small. No tails; sexes not greatly dissimilar. Greenish blue above, with a line at end of central cell, black-bordered and white-fringed. Beneath, gray, spotted as in *L. daedalus*. Female differs in being dark brown above. Expands 1.12. Found in California, Nevada, Colorado, Montana, and British America.

404. *LYCAENA ICAROIDES* Bd.

CALIFORNIA BLUE.

Large size. No tails; sexes not greatly dissimilar. Violet blue above, narrowly brown-margined outwardly; white-fringed. Nearly white beneath; a line of six spots on fore wings, and a double line in hind pair, outer, paler; a spot at end of each central cell; on hind wings all spots are white-ringed. Expands 1.50. Found in the mountains of California.

505a. *LYCAENA ICAROIDES MAYICOPA* REAK, is similar to type, but differs in being browner above, and darker below, with spottings larger, and the size smaller. Expands 1.25 to 1.35. Found in California.

405. *LYCAENA AMICA* Edw.

ARCTIC BLUE.

Size, small. No tails; silvery blue above, brown-bordered and white-fringed; line at end of central cell on fore wings. Glossy grayish white beneath. There is a line of minute spots on both wings, six on fore, and five on hind pair. Spot at end of cell repeated on fore wing, and two spots on upper margin of hind pair, one in middle and one at

base, and a sub-marginal line of faint dots, and another of brown crescents. Expands 1.10. Found at Mackenzie River, British America.

406. LYCAENA FULLA Edw.

NORTHERN PACIFIC BLUE.

Size, large. Purplish above, dusky-bordered, and white-fringed; white beneath, tinged with grayish brown. There is a blackish bar at end of central cell of fore wing; a sub-marginal band of faint dusky spots on both wings; (with traces of crescents) within this is a series of black spots, six, large on fore wings, smaller on hind pair. There is a dark spot near inner angle, much back of the line. Female, pale brown, a little bluish at base. More deeply tinted with brown than in the male. Expands 1.50. Found in California, Washington, and Vancouver's Island.

407. LYCAENA PEMBINA.

SLAVE LAKE BLUE.

Similar to *L. amicus*, but differs in being bluer above, in having eight dots on hind wings below, and a spot in cell, and is smaller. Expands .85 to 1.00. Found at Slave Lake, British America.

408. LYCAENA PHERES Bd.

PHERES BLUE.

Violet blue above, white-fringed and narrowly black-bordered. Very pale gray beneath; six black spots cross fore wing, and there is one at end cell; on hind pair are two lines of white spots, also a bright spot at end of cell, and one near base, none of the spots are pupiled. Expands 1.25. Found from California to British Columbia, and in Nevada, and Colorado.

408a. *LYCAENA PHERES EVIUS*, Bd. Differs from the type in being rather darker and the white spots on hind wing below are black-pupiled.

409. LYCAENA PHELEROS Bd.

DULL BLUE.

Size, small. No tails. Dull purplish blue above, dusky-bordered and white-fringed; brownish gray beneath, bluish at base of fore wings. There is a common sub-marginal line of small black crescents, and an inner line of black spots, minute and white-ringed on hind pair. There is a dot on upper margin, another in cell, and at end of cell is a narrow line; on fore pair a larger spot. Expands 1.10. Found in California, Utah, Nevada, and Colorado.

410. *LYCAENA ARDEA* EDW.

HERON BLUE.

Size, small; no tails. Violet blue above, dusky-bordered on fore wings and black-lined on hind pair; white-fringed. Yellowish white beneath, bluish at base of hind wings. On fore wings is an imperfect line of four white-ringed black spots and a sub-marginal line of faint brown crescents. At end of cell is a black spot; a white patch at end of cell on hind pair, and the spottings are faintly indicated. Expands .95. Found in Nevada.

411. *LYCAENA KODIAK* EDW.

KODIAK BLUE.

Medium size; no tails. Dull violet blue above, white-fringed and narrowly dusky bordered. Yellowish white beneath; there is a white-edged dusky bar at end of central cell on both wings, a common line of dusky spots, and a sub-marginal line of fainter spots; on hind pair a spot on cell and one on upper border. Female, dusky above, blue at base. Expands 1.25 to 1.30. Found at Kodiak, Alaska.

412. *LYCAENA XERXES* Bd.

XERXES BLUE.

Medium size; no tails. Blue above, (female grayish brown) white-fringed, paler beneath; a white spot at end of each central cell and a wavy sub-marginal line of white spots. All spots are pupilles. Expands 1.12. Was formally found in San Francisco, California, but supposed to be extinct.

413. *LYCAENA ANTIACIS* Bd.

OCCELATED BLUE.

Size, rather small; no tails. Violet blue above, with a slender black margin, white-fringed. Ashy gray beneath, with a line of black points, broadly white-ringed; there is a crescent at end of cell and two dots in it, all white ringed. Female blackish above. Expands 1.10. Found in California, Nevada, and Arizona.

413a. *LYCAENA ANTIACIS BEHRII* Edw. Glossy lilac blue above, silvery on upper margin of fore wings. Uniform bluish gray beneath; edge of outer margin dark brown, white-lined. On fore wings is a bar at end of cell, outside which is a row of six black spots broadly white-ringed. On hind wings is a small white spot on upper margin, a bar at end of cell, and a double row of small round spots, white-ringed, and three spots near lower margin.

413b. *LYCAENA ANTIACIS ORCUS* EDW. is purplish blue with spots very pale, and yellowish gray beneath. Found in California.

414. *LYCAENA COUPERII* GROUT.

COUPER'S BLUE.

Rather pale blue above, white-fringed and narrowly bordered, (broadly in female, and with a line at end of each central cell). Dusky gray beneath; a common line of black white-ringed spots, one spot at end of cell, on fore wing, one on upper border of hind pair, and one, without pupil, at end of cell, Fig. 54, e. Expands 1.25. Found in Anticosti, Southern Labrador, and Newfoundland.

415. *LYCAENA LYGDAMAS* DOUBL.

SILVERY BLUE.

Medium size. Beautiful silvery blue above, gray-fringed and narrowly black-margined. Gray beneath with black bars at end of cells and a common sub-marginal row of large black spots, two spots at base of hind wings, and one at base of fore pair; all spots white-ringed. Expands 1.10 to 1.25. Found in Michigan, and from Wisconsin to Georgia, also in West Virginia.

416. *LYCAENA SAGITTIGERA* FELD.

ARROW-HEAD BLUE.

Medium size. Dark blue above, white-fringed, and widely black-bordered. (female more so, and with some faint orange crescents above border at inner angle of hind wings.) Dusky beneath; a common line of black crescents, and a line of round spots inside them; the space between the lines being bluish and arrow-shaped on hind pair, Fig. 54, b. Patch in central cells, bluish, with a spot at end of cell on fore pair and two dots, side by side; one on hind pair and one above, bluish ringed. Expands 1.10 to 1.15. Found in California, Nevada, and Colorado.

417. *LYCAENA SPECIOSA* H. EDW.

BEAUTIFUL BLUE.

Size, very small; no tails. Pale silvery blue above, black-margined and broadly white-fringed, black at end of veins. Pale silvery gray beneath, with a minute dot on upper margin on fore wings, and a series of six sub-marginal spots. There is a small bar at end of cell, and a dot

on lower margin. On hind wings are, a basal dot, a minute point at end of cell, and a sub-marginal line of seven small spots; all spots black without white edges. Female dull smoky above, with the white fringe alternated with black, beneath there are some brownish overwashings the lower margin of fore wing is bordered with blackish, and the spots are large. Expands .70. Found in Southern California.

418. *LYCAENA SONORENSIS* FELD.

QUEEN BLUE.

Size, small. Blue above, black-bordered, a little more widely at apex of fore wings. Fringes white, interrupted by black. Three black spots on fore wings beyond central cell, and below them a bright scarlet patch, inside which is a black dot; a bar at end of cell. On hind wings are three dots. Beneath, brown with a row of bluish-ringed black spots; a bar at end of both central cells. and one above it on hind pair. The scarlet spot is divided. Female has the black spots larger and there is a second scarlet patch on hind wings. Expands 1.10. Found at Los Angeles and San Bernardo, California.

419. *LYCAENA PODARCE* FELD.

GRAY BLUE.

Medium size; no tails. Bluish gray above, white-fringed and dusky-bordered; a light space in middle of both wings and a pale-ringed crescent at the end of the central cells. On outer border of hind wings, is a row of white-ringed black spots, Fig. 54, c. Very pale beneath, dusky on basal half of both wings. There is a faintly indicated sub-marginal band of white-ringed dots, a central row of dots, one at end of each cell, two dots in cell of fore wings, in a white space, side by side, one in cell of hind pair, and one above and one below it, these last four white-ringed. Female brown above. Expands 1.15. Found in California and Nevada.

420. *LYCAENA AQUILO* Bd.

ARCTIC BLUE.

Similar to *L. podarce*, but differs in being smaller, and darker below, where the spottings are clearer. Expands 1.00. Found in Labrador and Arctic America.

421. *LYCAENA RUSTICA*.

RUSTIC BLUE.

Similar to *L. podarce*, but bluer above, with the marginal band of spots on hind wings above wanting; less ashy beneath, with the two spots in central cell of hind wings absent. Expands 1.15. Habitat, Colorado and British America.

422. *LYCAENA ENOPTES* Bd.

DOTTED BLUE.

Violet blue above, rather widely black-bordered, black-and-white-fringed on fore wings, white on hind pair. Beneath, ashy white, with a great number of black pale-ringed spots. On hind wings the two outer lines of dots are separated by a series of five yellow crescents. Found in California, Washington, and Arizona.

423. *LYCAENA ANNETTA* MEAD.

ANNETT'S BLUE.

Blue above, white-fringed, silvery on upper margin of fore wings near base. Pale bluish white beneath. On both wings is a marginal series of small dusky spots, preceded by crescents, behind which on hind wings is some yellowish, and a little on fore wings. On hind wings are three or four spots near inner angle, which are covered by pale blue metallic scales; there is a dusky bar at end of each central cell. Female, brownish above, and yellowish beneath. Expands 1.05 to 1.25. Habitat, Utah.

424. *LYCAENA ANNA* EDW.

ANNA'S BLUE.

Violet blue above, white-fringed. Whitish beneath, blue-tinted, most strongly at base, there is a very narrow black marginal line, a submarginal series of dots, followed closely by a line of small crescents, and the space between them is pale orange. There is a central band of dots, a bar at end of each cell, a spot within cell on hind wing, and two above it. Female, brown, with a marginal line of spots, which are partly enclosed by a series of pale orange crescents. Expands 1.15 to 1.25. Found from California to Colorado, also in Oregon, Montana, and at Belly River, British America.

425. *LYCAENA PSEUDARGIOLUS*.

COMMON BLUE.

PLATE X, 2.

Blue above with violet reflections; fore wings narrowly edged with black. Beneath, bluish white; there is a marginal series of pale dusky dots and crescents, a common band of black dots, a faint line at end of each central cell, a spot in cell of hind wings, and a spot above and below this; spots white-ringed. Female, with fore wings broadly bordered with black, which is widest at apex, and there is a marginal series of black dots on hind pair. Expands .90 to 1.25. Habitat, Alaska; British America to Quebec, Anticosta, New England to Georgia.

LUCIA Kirby, is a winter form, appearing in Massachusetts the last of April, in which the spots below are enlarged, and those on margin and middle are run together to a greater or less extent, Fig. 54, d.

MARGINATA Edw., another winter form, appearing with *lucia*, and in which the spots of the margin of hind wing only are fused together. Found in Ontario, and from Quebec to Long Island and in Colorado.

VIOLACEA Edw., also a winter form, has the spottings below quite distinct and prominent, never fused, and the color above is deep. Has the same range as the type and is also found in Pennsylvania and West Virginia.

NIGRA Edw., is a dimorphic form, colored below as in *violacea*, but black above. Found in West Virginia and Colorado.

NEGLECTA, is a summer form very pale above, with the hind wings noticeably paler than the fore pair and the spottings below are very small. Found in Ontario, Quebec, and from New England to West Virginia, and in Montana and Nevada.

425a. *LYCAENA PSEUDARGIOLUS CINEREA* Edw., is very small, ashy below, where the spottings are inconspicuous. Expands .90 to 1.00. Found in Arizona.

425b. *LYCAENA PSEUDARGIOLUS ARIZONENSIS* Edw. Deeper blue above than in the type and a little more ashy below; female, brownish above. Found in Arizona. Expands 1.25.

425c. *LYCAENA PSEUDARGIOLUS PIASUS* Bd., is a Pacific form, very bright violaceous above, ashy beneath, with the spottings very minute and pale. Expands 1.10. Habitat, California.

425d. *LYCAENA PSEUDARGIOLUS ECHO* Edw., somewhat resembles the Eastern form *neglecta* being very pale on both surfaces. Found in California and Arizona.

426. *LYCAENA SCUDDERII* EDW.

SCUDDER'S BLUE.

Similar to *L. battoides* but differs in having white fringes above. (Female brown above with a sub-marginal series of yellow crescents on hind wings.) Gray beneath, not yellowish, there is no spot in central cell of fore wing, and the sub-marginal series of crescents on hind pair are edged inwardly with silver. Expands 1.12. Found in New York, Michigan, Wisconsin, Ontario, and Lake Lahache, British Columbia.

427. *LYCAENA AFRA* EDW.

SASKN BLUE.

Size, small; no tails. Deep blue above, dusky-margined, very broad on fore wings; yellow-fringed. There is a black streak at end of central cell. Grayish below, with a common central line of minute black spots, each white-edged. Streaks at end of cell repeated, but slighter, and white-edged. Expands .90. Found at Saskn, British America.

428. *LYCAENA LOTIS* LINTN.

LOTIS BLUE.

Size, small; no tails. Violet blue above, black-bordered and white-fringed. Gray beneath, spotted as in *L. scudderi*, differs in having the black marginal spots on the hind wings covered with greenish metallic scales, not bluish, and outside these is a series of orange crescents, inclined to be arrow-shaped. The female is uniformly brown above. Expands 1.25 to 1.30. Found in Mendicino, California.

429. *LYCAENA ASTER* EDW

ASTER BLUE.

Size, medium. No tails. Purplish blue above, silvery on upper margin of fore wings, black-bordered and white-fringed. On hind wings is a marginal line of white points. White beneath on fore wings, dusky-bordered. There is a sub-marginal line of round black spots, a central line of black dots crossing both wings. On hind wings are sub-marginal metallic spots, each surrounded with orange, and above these are black crescents. There is a bar at end of each central cell, broadest on fore wings; a dot in cell on hind wings, and one below it. Female, dusky above with spots larger; yellowish below, with spottings heavier. Expands 1.00 to 1.10. Habitat, Newfoundland.

430. *LYCAENA GLAUCON* EDW.

COLORADO BLUE.

Size, small. Purplish blue, of the same shade as *L. comyntas*, blackish-bordered, which is of equal width on fore wings, wider on hind pair, where there is a series of crescents, of these, two at inner angle are somewhat orange. Grayish brown beneath, tinted with blue at base of hind wings. There is a double row of marginal brown spots, the outer crescent-shape, and indistinct on fore wings, but larger on hind pair, while the space between the two lines is orange. There is a bent bar at end of cell, two spots between cell and upper margin, a third near base, and one below cell. Female, brown above with a marginal row of brown spots partly enclosed with orange. Expands .95.

Fig. 53.



Illustrating the genus *Chrysophanus*; a, upper side, hind wing, *helloides*; b, upper side, fore wing, *fasciata*; c, *adrienne*; e, same epixanth; f, antennae of same; d, lower side, *rubidus*.

431. *LYCAENA BATTOIDES* BEHR.

BEHR'S BLUE.

Size, small. Dark violet blue above, dusky-margined and smoky-fringed. Yellowish gray beneath, with a bar at end on each cell with a central and sub-marginal line of spots, the latter having each spot surmounted by a crescent, and the space between the spot and crescent is yellowish and there is a spot in cell of fore wing. Expands 1.00. Habitat, California, Nevada, and Colorado.

432. *LYCAENA SHASTA* EDW.

SHASTA BLUE.

Size, small. Violet blue above, tinged with pinkish, broadly dusky-margined and brown-fringed. There is a broad spot at end of each cell; and two or three dusky spots near inner angle of hind wings, the second surmounted by a pale yellow crescent. Grayish white beneath, spots at end of cells repeated, and there is one dusky spot in cell on fore wing, and three in that on hind pair. Central line of spots dusky, and there is a fainter sub-marginal line on fore wing, each spot surmounted by a faint crescent. On hind wings is a bordering line of small metallic blue spots, each of which is surmounted by a dusky crescent. Female brown above, with an extra line of yellow crescents on inner angle of hind wings.

Expands 1.00. Found from California to Oregon, also in Utah, Nevada, Montana, and Kansas.

433. *LYCAENA MELISSA* EDW.

YELLOW-SPOTTED BLUE.

Violet blue above, bordered by a black line and white-fringed. Pale gray beneath, bordered as above; there is a sub-marginal line of bluish spots, within this a line of orange spots, dusky-edged inwardly, then a line of black spots; a bar at end of each central cell, one in cell on hind wings, and one above and one below it. Female brown above, with a marginal series of black spots, within which is a series of orange crescents, partly enclosing spots. Expands 1.20 to 1.25. Found in Arizona, New Mexico, Colorado, Nevada, Montana, and Kansas.

434. *LYCAENA ACMON* DOUBL-HIEWT.

ACMON BLUE.

Violet blue above, edged with a black line; on hind wings is a row of black sub-marginal spots, succeeded inwardly by a narrow band of orange. Fringe, white; female brown above, with the orange sub-marginal band. Pale blue beneath, with a sub-marginal band of dots, each surmounted by a small inwardly black-edged crescent; there is a central line of dots, a bar at end of central cells, one in cell on hind pair, and one above it, and one on upper border, near middle. Expands .75 to 1.00. Found from California to Washington, and from Arizona to Montana.

435. *LYCAENA COMYNTAS* GOLT.

TAILED BLUE.

Size, small; one tail on hind wings. Deep blue above, with violet reflections, dusky bordered, (female wholly dusky) the border being of about equal width on both wings. There is a marginal series of black dots the two first, near tail, being surmounted by an orange crescent, Fig. 54, a. Whitish beneath, margined with a double black line, then a line of black dots followed by a line of crescents, then a central line of spots, a line at end of each cell, a spot in cell of hind wing, and one above, and below it; all spots are pale and white-ringed. The spots and orange crescents on inner angle are repeated, but the former are black, and are ringed with metallic gold. Expands 1.00 to 1.20. Found, from the Atlantic States to the Rocky Mountains, and in Colorado.

436. *LYCAENA AMYNTULA* Bd.

WESTERN TAILED BLUE.

Quite similar to *L. comyntas* in form and general markings, but differs in having the border in fore wings above wider at apex than elsewhere. Beneath, there is only one of the spots on inner angle gold encircled. Expands 1.25 to 1.30. Found in California, Washington, Arizona, Nevada, and at Calgary, British Columbia.

437. *LYCAENA MONICA* Reak.

PURPLISH BLUE.

Tails, present. Purplish above, blue at base; at inner angle are two black dots in a white field, but with no orange. Beneath, similar to *L. comyntas*, with the orange crescent at inner angle of hind wings, but the black dots are without golden rings. Expands 1.25. Found in Southern California and Arizona.

438. *LYCAENA ALCE* Edw.

BLACKISH BLUE.

Brownish black above, glossed with violet blue, with the bordering line, broadest at apex of fore wing. There is a black dot at inner angle of hind wing; beneath dark ashy, spotted much as in *L. comyntas*, but the central line is larger. There is a yellowish crescent over the third black spot on inner angle of hind wing, and the first and third spots are surrounded with golden green atoms. Expands .88. Habitat, Colorado, New Mexico, Arizona, and Kansas.

439. *LYCAENA GYAS* Edw.

PALE VIOLET BLUE.

Pale violet blue above, unspotted, excepting a dusky dot at inner angle; pale brown below. There is a common row of pale spots and on fore wings a trace of crescents; there are faint lines at end of each cell; there is a spot in cell of hind wings, and two others above this. The marginal row of spots on hind wings indistinct, excepting first two, which are black. Expands .95. Habitat, Arizona.

440. *LYCAENA CYNA* Edw.

TEXAS BLUE.

Purplish blue above, broadly dusky-bordered on fore wings, more narrowly on hind wings; at end of central cell is a faint streak. Pale yellowish brown beneath, slightly washed with white. On both wings

is a marginal series of buff spots, preceded by a wavy line of the same color, all on white ground. There is a central row of brown spots, on fore wings, eight and large; on hind wings, seven and small; a bar at end of each central cell. Expands .90.

441. *LYCAENA FILENUS* POEY.

SOUTHERN BLUE.

Size, small; tails, present. Violet blue above, of the same shade as *L. comyntas*, narrowly black-bordered, and with a black dot on outer margin of hind wing, not far from inner angle. Beneath ashy, white-fringed; there is a double series of marginal crescents bluish white, then a central row of dusky spots, bluish white-encircled; a dusky white-edged crescent at end of each central cell and four white-ringed black spots near base of hind wing, the three upper larger and very dark. The spot seen above near inner angle of hind wing is black, orange-ringed and sprinkled with green metallic atoms on the outer edge, Fig. 54, b. Female. brown above, tinged with bluish. Expands .75 to .95. Habitat, Gulf States.

442. *LYCAENA AMMON*.

FLORIDA BLUE.

Similar above to *L. filenus*, but the white fringe is cut by the black veins. Beneath, also similar to *filenus*, but differs in having the space between the outer and middle bands of spots white, broadest on hind wings, and there are two black spots near inner angle of hind wings both ringed with metallic blue scales and the one nearest the angle is surmounted with an orange crescent. Female differs in having a border of black on upper and outer border of both wings, and a marginal series of blue crescents on hind wings; there are two black spots near inner angle, the second surmounted by an orange crescent. Expands 1.05. Habitat, Cuba and South-eastern and Southern Florida.

446. *LYCAENA THEONUS* LUC.

WEST INDIAN BLUE.

Size and general coloration of *L. filenus*, but differs in having no black spot on hind wings above, but all on the markings below show through. The marginal markings beneath, are similar to those of *filenus*, but within these are about six rather broad dusky bands, the third, fifth, and sixth, counting from base on fore wing, reach only half across wing, and the first within the marginal bands on hind pair are prominent on the center only, thus leaving white spaces on both wings. On inner angle of hind wings are two black spots, encircled with green met-

allic atoms, and ringed with pale yellow, Fig. 54, c. Expands .90 to .95. Habitat, West Indies, Key West, and Sanford, Florida.

444. *LYCAENA MARINA* REAK.

MARINA BLUE.

Similar to *L. theonus*, but is larger, and all of the bands beneath cross the wings excepting the seventh and eighth. Expands .85 to 1.05. Found in Southern California Southern Colorado, and Arizona,

445. *LYCAENA ISOPHTHALMA* HERR-SCHAEFF.

DWARF BLUE.

Size, very small. Yellowish brown above, with a marginal line of black dots on hind wings. Paler beneath, with both wings crossed with six or seven rows of elongated white dots or short lines, and at base, by a row of rings. On outer margin of hind wings, in a buff field, are six black spots edged outwardly by golden metallic atoms. Expands .75. Found in Florida and Georgia. Fig. 54, d.

446. *LYCAENA EXILIS* Bd.

PIGMY BLUE.

Size, exceedingly small. Generally similar to *L. isophthalma*, but differs in being more reddish brown above. Beneath, the base of fore wings is plain brown with no markings and there are three dusky dots in base of hind wings, no rings. White markings as in *isophthalma*, but the sub-marginal space on hind wings is white, the first sub-marginal dot at inner angle is double, and covered with greenish metallic atoms, and the two at outer angle are also covered with metallic green, others black, greenish on outer side only. Expands .50 to .75. Found in California, Arizona, New Mexico, Colorado, Texas, and Florida.

Family V. *HESPERIDAE*. The Skippers.

SIZE, SMALL TO MEDIUM. LEGS, SIX. ANTENNAE, WITH CLUB USUALLY HOOKED TERMINALLY. FLIGHT, RAPID, AND SPHINX-LIKE.

GENUS LIV. *CARTEROCEPHALUS*. PIGMY SKIPPERS.

Size, small. Colors brown, orange spotted above. Fore wings, long and triangular; hind wings, short and rounded. Terminal process of club of antennae, hooked. TYPE, *C. MANDAN*. (Plate X. 2.)

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EXPLANATION OF FIGURES ON PLATE IX.

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| 1. <i>Satyrus alope.</i> | 2. <i>Chionobas semidea.</i> | 3. <i>Libythea</i> |
| <i>bachmani.</i> | 4. <i>Lemonias virgulti.</i> | 5. <i>Calephelis caenus.</i> |
| 6. <i>Eumenia atala.</i> | 7. <i>Thecla poeos.</i> | 8. <i>Feniseca tarquinius.</i> |
| 9. <i>Chrysophanus hypophleas.</i> | | |

PLATE IX.



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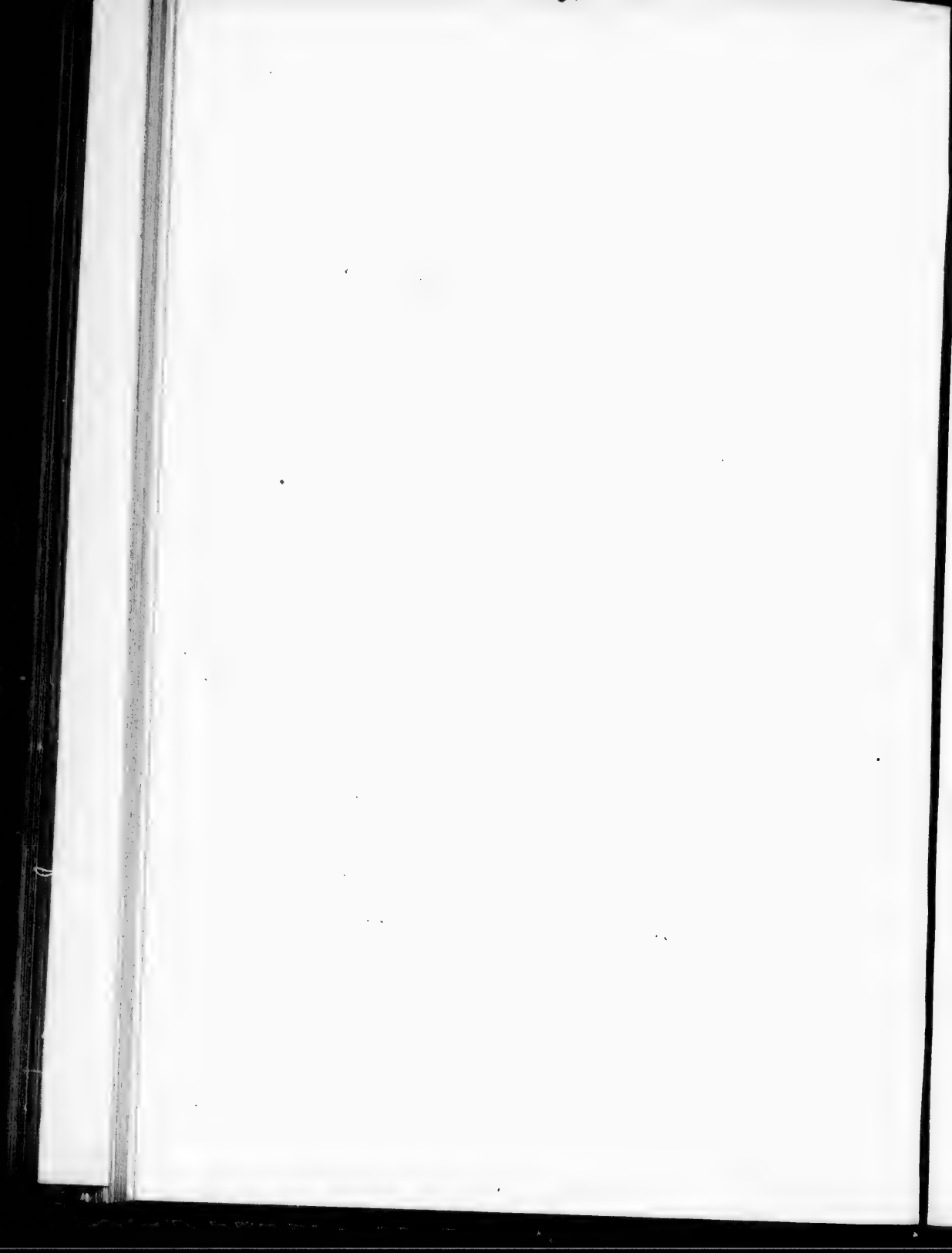


6

North American Butterflies.

C. J. M.

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447. *CARTEROCEPHALUS MANDAN*. EDW.

DWARF SKIPPER.

Dark brown above, slightly yellowish, dull orange-spotted as follows; an indistinct row across outer margin of fore wing, another across middle, two of these nearer outer margin, than the others; two large patches in cell, a small spot on lower side of cell, and another below it; on hind wing, three rows of spots. Beneath, paler, with the light markings larger and nearly run together, and there is an additional spot on hind wings over basal. Expands 1.50. Habitat, White Mountains, New Hampshire, and in Maine.

448. *CARTEROCEPHALUS OMAHA* EDW.

OMAHA SKIPPER.

Smaller than the last, brown above, on fore wing orange-margined; then a sub-marginal row of spots, broken opposite cell, two upper spots outside the line, a broad orange patch in middle of wing, with a brown streak in central cell. Paler brown beneath, overwashed with orange, spots repeated but enlarged. Expands 1.00. Habitat, West Virginia Colorado, and California.

GENUS LV. *ANYCLOXYPHIA*. MARGINED SKIPPERS.

Size, very small. Colors, brown, with orange patch in middle of both wings. Both wings, long and narrow. Body, long and slender. Club of antennae, with terminal, minute, and not hooked. TYPE A. NUMITOR. (Plate X, 3.)

449. *ANCYLOXYPHIA NUMITOR* FAB.

BORDERED SKIPPER.

Brown above, orange-fringed, and with more or less distinct orange patch in center of fore wing, containing a black dash, central patch brighter on hind pair, and reaching inner margin. Orange beneath, including body, with a triangular patch of dark brown in center of fore wing, reaching lower margin. Expands 1.00 to 1.10. Found from Maine to Nebraska and to Texas.

GENUS LVI. COPAEODES. YELLOW SKIPPERS.

Size, small; colors, yellowish, brown-bordered. Fore wings, long and triangular, hind pair, short, and also triangular. Body, short and stout. Antennae with terminal process of club, small and blunt, not hooked. TYPE C. WRIGHTII. (Plate X. 4.)

450. COPAEODES WRIGHTII EDW.

WRIGHT'S YELLOW SKIPPER.

Yellowish orange, paler beneath, narrowly bordered with dusky, excepting on lower border, this being broken into dots on lower surface. There is an oblique dash across middle of fore wing above, and some dusky scales on hind wing below near base. Expands .85. Habitat, Mohave, California.

451. COPAEODES MYRTIS EDW.

ARIZONA YELLOW SKIPPER.

Bright reddish orange above, brown-bordered all around, excepting lower margin of fore wings, outwardly on fore wings broadest at apex, narrowing to lower margin, narrowly on upper half of outer margin of hind wings, and on lower margin, but broadly on upper margin. Brown on lower surface of fore wings, yellowish at apex, and there is a black stripe from base to lower angle. On hind wings wholly yellowish. Expands .80. Habitat, Arizona.

452. COPAEODES ENNUS EDW.

PALE YELLOW SKIPPER.

Similar to *C. wrightii*, but differs in being much paler above, there is no black border to outer margin of fore wings, this being restricted to upper margin, and on this wing there is a black stripe along lower margin of base, in addition to the oblique dash. Expands 1.00. Habitat, Kern River, California.

453. COPAEODES PROCRIS EDW.

PROCRIS SKIPPER.

Bright glossy yellow above, dusky near base of upper margin of fore wing; there is a straight black streak below central cell on a ridge raised above the surface. Beneath, paler on hind wings; at base of fore pair is a black patch, not reaching upper margin, and extending half

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way along lower margin, then projecting a short streak upward. Female differs in being brownish on fore wings. Expands .90. Found in Texas, New Mexico, Arizona, and Southern California.

454. COPAEODES ARENE EDW.

ARENE SKIPPER.

Size of the preceding, and of the same ground color, but differs in having the outer and lower margin of fore wings dusky-bordered, and the upper margin edged with the same. At end of central cell are two short dusky lines. There is a broad dusky border on hind wings on upper margin, and a narrow edge along outer margin. Beneath, fore wings are lighter, and dusky-bordered along lower margin. Hind wings, paler and unspotted. Expands .90. Found in Texas and Arizona.

GENUS LVII. THYMELICUS. BROAD-WINGED SKIPPERS.

Size, small; colors, plain brown. Wings, broad and triangular. Antennae, very short, club large and without terminal process. Palpi long. Body, long and slender. TYPE T. GARITA. (Plate X, 5.)

455. THYMELICUS GARITA REAK.

ORANGE-TINTED BROAD-WING.

Brown above, with violet reflections; upper border of fore wings tinged with orange, this beneath is cut with whitish veinings, and the veinings on hind wing are whitish, and the surface excepting near lower margin is sprinkled with whitish; fringes, whitish. Expands 1.00. Habitat, Colorado, Dakota, and Fort Ellis, British America.

456. THYMELICUS POWESCHIEK PARK.

PARKER'S BROAD-WING.

Larger than the last, colors similar, differs in having the apex of fore wings whitish, and the fringes are brown, white at base. Expands 1.20. Habitat, Iowa, Illinois, Montana, and Colorado.

GENUS LVIII.

PAMPHILA. ORANGE AND BROWN SKIPPERS.

Size, small to medium; colors brown, often prominently marked with orange. Fore wings, long and triangular, hind pair short and rounded; body, short and thick. An-

tennae, of medium length, and with the terminal process of the club long and hooked. The male usually has a black dot on fore wings. TYPE *P. PECKIUS*. (Plate X, 6.)

457. *PAMPHILA MASSASOIT* SCUD.

YELLOW CROSS SKIPPER.

Size, medium. Brown above, without markings, but occasionally with a row of three faint spots near upper margin of fore wings, and in center of hind pair. Reddish brown on fore wings beneath, with three small reddish dots near the outer portion of upper border, and a marginal band of reddish, widest above. Dusky orange on hind wings, with a large yellow cross in middle, with the arms bent down, the shaft resting on base of wings, Fig. 55, a. Female has the spottings above more constant. Expands 1.10 to 1.40. Habitat, Eastern and Middle States (Rare in Massachusetts) Nebraska, Texas, and Colorado. Occurs in June.

458. *PAMPHILA ZABULON* BD-LEC.

YELLOW-FRINGED BROWN SKIPPER.

Orange above, bordered outwardly on fore wing and slightly on lower margin, and all around on hind wing with brown. There is a black dash across bend of cell on fore wing, Fig. 54, e, and one slightly indicated on hind pair and the brown border is indented opposite the cell on both wings. Beneath, similar, but yellowish, with brown border paler, not as extended, and wanting on upper border of hind wing, and slightly washed with whitish. Female similar, but darker. Expands 1.20 to 1.25. Occurs in May and June in Massachusetts.

458a. *PAMPHILA HOBOMOK*, Harr. Similar to type, but differs in having the brown markings more extended, there being a brown patch above, and beyond the black dash across end of cell, leaving two spots between this and the border, Fig. 54, f.

POCAHONTAS Scud., is a dark form of the female in which the whole surface is brown with an outer line of whitish spots most clearly defined above, larger below and somewhat diffused, Fig. 55, b; there are traces of a spot in central cell, and one in middle of hind wing. Beneath, tinged with purplish white; black dash present on both surfaces of fore wing.

QUADRAQUINA Scud., is also a dark form of the female in which there is no spot in the central cell of fore wing, and none on hind pair,

the spots of the outer line are small, tinged with purplish below, but the brown is brighter and has a decided bronzy reflection. All of these forms occur in Massachusetts, at least, with the typical *P. zabulon*.

459. *PAMPHILA TAXILES* EDW.

WESTERN BROWN AND ORANGE SKIPPER.

Similar to *P. zabulon*, but differs in having the orange greatly extended above, the brown being reduced to a narrow edging. Hind wings mottled beneath with yellow and pale reddish brown. The female is dusky, mottled above with yellowish and also on hind wings below. Expands 1.10 to 1.20. Found in Arizona, Colorado, Nevada, and Southern California.

460. *PAMPHILA LASUS* EDW.

ARIZONA SKIPPER.

Similar to *P. ottee* above; pale yellow beneath, on upper border of fore wings and on whole of hind pair, tinged with greenish. Part of central cell of fore wing, orange, black at base and along lower margin; there is a buff patch on middle of outer border and above this is an orange patch near margin. On upper border are three white spots and an oblique row across middle of outer. Hind wings have the upper margin mottled with brown; the upper and middle veins and branches clear white, and crossing outer portion of wing is a band of white confluent spots bent at right angles near middle; most of the spots are slightly edged with black outwardly. There is a small white spot with black scales on inner side in central cell, and the ends of the veins are dotted with brown. Expands, 1.40. Found in Southern Arizona.

461. *PAMPHILA RURICOLA* Bd.

YELLOW-GREEN SKIPPER.

Yellow above, with a narrow brown border with the black dash like that of *P. columbia*, divided lengthwise by a fine whitish line. Yellow beneath, strongly greenish tinged. Expands 1.10 to 1.20. Found in Napa County, California.

462. *PAMPHILA SASSACUS* HARR.

PALE-SPOTTED SKIPPER.

Size, medium. Orange above, brown-bordered all around on both wings, on fore pair, widest outwardly, very narrowly above and below; on hind wings widest on lower margin. Within the border on fore wing is a brown oblong patch, reaching nearly to the dash, and between this spot and the border are two nearly square orange spots, and above the

brown spot three others longer, and divided from the orange within by a faintly dusky patch. The dash is black, long and slender, with both edges straight for two-thirds its length, then it is broken, and the end of the basal third extended beneath the outer portion; both portions are divided in the middle by a silvery white line. Beneath paler, with base of fore wings dusky, and the markings seen above faintly indicated; on hind wing is a faintly defined band of pale spots on outer portion, with one or two at base. Female generally similar, but with the brown predominating, and the orange is pale. Beneath, dusky, and the light markings are better defined than in the male. The space above occupied by the dash, and below it is brown, and there is a brown patch in center of fore wing. Expands 1.00 to 1.25. Habitat, New England and New York to Nebraska and Georgia, Florida and Colorado. Occurs in Massachusetts in June. Fig. 55, e.

Fig. 54.



a, upper side, hind wing, *Lycæna comyntas*; b, lower side same, *L. flenus*; c, same, *L. theonus*; d, same, *L. isophthalma*; e, upper side, fore wing, *Pamphila zabulon*; f, same, *P. z. hobomck*.

463. PAMPHILA NEVADA SCUD.

NEVADA SKIPPER.

Similar to *P. sassacus*, but differs in having the border less distinct above, the dash is wider, not as long, and at the division of the central lines sends out a projection above and below, forming a short-armed cross. Beneath, greenish-tinged over surface of hind wing, and on apex of fore pair, where the spottings are nearly white. On hings are five or six irregular white spots dusky-edged, Fig. 55, e. Expands 1.00 to 1.35. Found in Nevada, Colorado, Arizona, and British America. Occurs in June and July.

464. PAMPHILA COLORADO SCUD.

COLORADO SKIPPER.

Very similar to *P. sassacus* above, but the spots at apex of fore wings are smaller, and the dash is not straight on upper edge. Beneath, not as green as in *P. nevada*, and there are two bent white spots on hind wing, one within the other, Fig. 55, d, broken in the female to a greater or less extent. Expands 1.00 to 1.25. Found in California, Washington, Colorado, and British America.

464a. *PAMPHILA COLORADO IDAHO* Edw., is paler than the type, being grayish yellow beneath. Occurs in July.

465. *PAMPHILA OREGONIA* EDW.

OREGON SKIPPER.

Similar to *P. columbia*, but paler above, grayish yellow below and the outer bar on hind wing frequently assumes the form of spots. Expands 1.00 to 1.25. Found in California, Nevada, and British America.

466. *PAMPHILA COLUMBIA* SCUD.

COLUMBIA SKIPPER.

Paler than *P. sassacus* above, with the bordering not extending along upper margin of fore wing, nor is there any dusky within the three upper spots on apex; the dash is a long oval, with the division of the central line slight. Beneath, green-tinted on extreme apex of fore wings only, and not on lower border of hind pair, where there is a straight white bar, within which are two white spots, Fig. 55, f. Female with spot on outer border of hind wing beneath extended and curved. On fore wing above, is a white spot, beyond, a brown spot in middle of wing, extended below. Expands 1.00 to 1.25. Found in California.

467. *PAMPHILA MANITOBA* SCUD.

NORTHERN SKIPPER.

Similar in color to *P. sassacus* above, with the dark area more extended, the spot on hind wing being reduced to a band; spottings on apex of fore wing small, and the dash is about as in *P. colorado*. Quite green beneath, with spottings on hind wings very small, Fig. 55, e. Female, similar to *sassacus* above with a continuous band on outer portion of hind wing beneath, and two spots within it. Expands 1.10 to 1.35. Found in Lake Winnipeg, British Columbia, Washington, and California. Occurs in July.

468. *PAMPHILA JUBA* SCUD.

JUBA SKIPPER.

Size, rather large. Paler than *P. sassacus*, spottings at apex of fore wings above distinct and large, and the dash is much as in *sassacus*. Green-tinted beneath, on hind wing, and apex of fore pair, where the spottings are repeated white, and there is another white spot below the three upper. On hind wings are about four white spots, the outer long, Fig. 55, g. Expands 1.25 to 1.50. Found in California and Colorado.

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468a. *PAMPHILA JUBA VIRIDIS* Edw. Similar to type, but darker above and below, where the hind wings are thickly dusted with golden green scales. Found in Los Vegas, New Mexico.

469. *PAMPHILA HARPALUS* EDW.

ORANGE-STREAKED SKIPPER.

Similar to *P. sassacus*, but lacks the brown patch in apex beyond end of dash, but the three orange spots are present. The dash is long, slender, and bent down a little at base. Hind wings brown, with an orange streak through central cell nearly to outer margin. Beneath, quite similar to *sassacus* but rather more tinged with ochreous at apex of fore wings. Expands .95. Habitat, Nevada.

470. *PAMPHILA PAWNEE* DODGE.

PAWNEE SKIPPER.

Rather large size; orange above, broadly bordered with brown. There are three small orange spots at apex of fore wings; at end of central cell is a small black line, and a yellowish white spot in cell; dash large and black, followed by a brownish shade. There are two square orange spots in apex below the three, which separate an oval brown patch from the border. Hind wings brown, dusted heavily with orange along upper border and more narrowly along the outer margin. Beneath, both wings are pale yellow unspotted. Female, pale brown, with purplish reflections. There is a large square spot of white in cell and a row of white spots along outer margin of fore wings, and a row on hind wings, and a row of similar spots on hind pair. Expands 1.45. Found in Nebraska and Montana.

471. *PAMPHILA OTTOE* EDW.

PLAIN YELLOW SKIPPER.

Size, rather large. Orange yellow above, slightly black bordered; dash large, Fig. 56, a, and outside of it is a slight spot. Beneath, a little paler, without markings. Expands 1.50. Found in Nebraska, Indian Territory, and Arizona.

472. *PAMPHILA CABELUS* EDW.

CABELUS SKIPPER.

Yellowish orange above, broadly edged with pale dusky on fore wing, and more narrowly on hind pair. Dash, long, slender and curved. On upper border of fore wings are two or three little indistinct spots, and two minute ones opposite the cell. Reddish orange beneath, yellowish

at apex and along outer margin, a little black at base and at inner angle. Hind wings golden orange, with a few small spots. Expands 1.20 to 1.30. Found in Nevada and California.

473. *PAMHPILA NAPA* EDW.

ALLIED SKIPPER.

Similar to *P. mystic* above, but pale orange yellow below, with no markings on hind wings, those on fore wings repeated. Female, similar to male, the black dash is replaced by a dusky patch. Expands 1.25. Found in Colorado.

474. *PAMPHILA METEA* SCUD.

WHITE-BANDED SKIPPER.

Yellowish brown above, orange-tinted at base of fore wings; dash, long and slender, elevated and black, divided by the lower branch of middle vein; outside of dash is a triangular patch of buff; at end of cell two elongated dots, outside these, near margin, two square spots, above these, near upper border, three others, all buff. On hind wings is an arrow-shaped mark of buff with the point nearly touching outer margin. Both wings are narrowly black-edged and yellowish-fringed; beneath, a little yellower with markings repeated, but larger and paler on fore wing, and on hind the arrow-shaped mark reaches from near the base, on upper portion, to near the lower border at inner angle, and sends spurs out along the veins, two of which connect with a patch nearer base, all these marks being whitish. Fig. 56, b. Female, similar, browner, with the spottings whiter and more restricted on both surfaces. Expands 1.10 to 1.15. Found in Texas, Colorado, New York, Connecticut, and at Scituate, Massachusetts, where I have taken it the second week in May.

475. *PMAPHILA RHESUS* EDW.

BROWN-BANDED SKIPPER.

Glossy brown above, with three spots in apex of fore wing, below which is an oblique bar of white spots and a spot at end of central cell. Hind wings, unspotted, fringed with dull white. Beneath, dusky on fore wings, bordered on upper margin with greenish yellow, spots repeated more distinctly; hind wings dusky on upper and outer margin, broadly bordered with greenish yellow, with white markings much as in *P. metea*, but narrower. Female, paler, all spots distinct and the white band seen below is repeated above. Expands 1.15. Found in Colorado and Arizona.

476. PAMPHILA CARUS EDW.

SOUTH-WESTERN SKIPPER.

Size, medium. Pale brown above, slightly yellow-tinted; two minute spots in apex, and two others beneath them, yellowish white; an obscure spot at end of central cell. Dash, short and black; hind wings with a curved row of indistinct, minute, yellowish white spots on upper half of wing. Fringes, dull white. Brown below, dusted with yellowish on upper and lower margins of both wings. Spots repeated on fore wings, with an extra one at apex, two at end of cell, and two in it. On hind wings, spots enlarged; also a large spot in cell. Expands 1.10 to 1.25. Found in Western Texas and Arizona.

477. PAMPHILA UNCAS EDW.

UNCAS SKIPPER.

Size, large. Dusky above; cell of fore wing and patch below dash, orange yellow, outer portion washed with yellow, containing a row of five yellow spots. Dash, narrow, jet black, and contracted in the middle. Hind wings, heavily washed with yellow, excepting on upper border, orange-tinted in central portion, white-fringed. Gray beneath, yellow-washed; spots, repeated, white, and these on outer margin of fore wing run together in three groups. On hind wings are two very much bent bands, the outer not reaching lower margin. Female, with the base and outer portion of fore wing, and a broad band from base to outer margin, washed with orange. On outer portion of fore wings is a broken row of spots, whitish, excepting the last which is yellowish, and a small spot at end of cell; on hind wings the spots below show indistinctly, beneath as in male. Expands 1.35 to 1.60. Found from Delaware to Ohio; from Dakota to Arizona, and in British America.

478. PAMPHILA LICINUS EDW.

TEXAS SKIPPER.

Size, medium. Dusky above, with a large orange patch in center of fore wing, within which is the dash, which is long, narrow, and slightly curved, dusky, velvet black at the extremities. There are three spots in apex, two below these, opposite cell, and a small orange spot at end of dash nearly connected with the central patch. On hind wings is a large sub-triangular patch, dusky in center, paler toward outer portion; fringe, grayish. Beneath, brown, overwashed with orange on upper margin of fore wing, especially next base; spots, repeated, with two extra at end of cell, and two larger yellowish white, below dash, reaching lower mar-

in. On hind wings, is a row of small white spots, connected so as to form a continuous line, bent at right angles; two dots in cell. Expands 1.35. Habitat, Southern Arizona.

479. PAMPHILA SEMINOLE Scud.

SEMINOLE SKIPPER.

Size, medium. Brown above with violet reflections, with base and upper margin of fore wing sprinkled with yellowish; three small spots in apex, two below opposite cell, three larger below these, one in each interspace of middle vein, and a bar at end of cell, all yellow. Dash, narrow, black. Hind wing, unspotted, greenish-tinged. Beneath, more strongly washed with yellowish, this taking the form of a band across hind wing, where it sends out a bar on each side in the middle, and contains a round dusky spot; spots on fore wings repeated, enlarged. Female similar but lacks the bar at end of cell on fore wing and has very little yellow overwashing above. Expands 1.35. Habitat, New Jersey, North California, Florida and Iowa.

480. PAMPHILA ATTALUS Edw.

ATTALUS SKIPPER.

Female, dusky above, somewhat suffused with orange; on fore wings are three small spots in apex; a large spot at end of cell, a triangular one below it, another triangular below this and a patch below all. On hind wings is a row of indistinct yellow spots bent at right angles so as to be nearly parallel to outer and upper margins. On hind wings beneath, yellowish ochraceous, dusky on lower side of fore wings, spots repeated with two extra spots opposite cell on fore wing, and four spots on hind wing near outer margin. Expands 1.40. Habitat, Texas.

481. PAMPHILA SNOWI Edw.

SNOW'S SKIPPER.

Form similar to that of *P. morisonii*. Orange above, with a broad brown border; from end of dash a patch extends toward apex, and back of this is a band of yellowish orange, following around dash and ending at middle of lower margin; above dash to upper margin and base is reddish orange. Dash, long and in the shape of a narrow ridge, somewhat brown-edged. On hind wings is a yellowish orange band bent at right angles. Reddish orange beneath on fore wings, brown along upper margin, band repeated, upper part in white, lower in yellow; apex, reddish brown. Hind wings, dark rusty, dusted with dull orange, clearer orange in middle, yellow on upper margin; band repeated, pure white and in

cell is a longitudinal white band; female, similar. Expands 1.30. Habitat, Colorado, New Mexico, and Arizona.

482. *PAMPHILA LEONARDUS* HARR.

LEONARD'S SKIPPER.

Size, large. Brown above with basal half of fore wing, and an arrow-shaped band on hind wing, deep orange, beyond which the wing is overwashed with orange. At apex on fore wing are three spots, two below these somewhat widely separated and a wedge-shaped spot at end of dash; all orange. Dash, black, widest at base with a raised orange division, Fig. 56, c. Beneath, deep rusty orange spots on fore wings repeated but yellower, and there are two extra ones at end of central cell. Below cell is a large triangular yellow patch on a dusky field. On hind wings the band is repeated in separate white spots with an extra white spot at end of cell. Female similar, but there is a tinting only of orange at base of fore wing and there is a band of yellow spots at end of cell; band on hind wings is straighter, and yellow below; spots on fore wing below, repeated, as in the male. Expands 1.35 to 1.50. Found from New England (rarely in Massachusetts) to West Virginia, at Indian River, Florida. and in Kansas and Quebec.

483. *PAMPHILA MESKEI* EDW.

MESKE'S SKIPPER.

Size, very large. Dash in two sections, black, the outer a smooth ridge, inner short, behind dash is a rough blackish patch. Dark brown above, with reddish orange markings as follows, three small spots near apex of fore wing, two below these opposite cell, and an oblique line of larger spots below these, which merge into the reddish orange of the central cell and base. There is an obscure patch in middle of fore wing, and some indistinct spots between this and the outer margin. Under sides of hind wings and apex of fore wings bright rusty orange, unspotted on hind pair, with spots on fore wings repeated indistinctly, dusky at base. Female, similar above to male, but dusky at base of fore wings, and the spots on hind pair are more distinct, and are repeated below. Expands 1.50 to 1.60. Found in Texas and at Indian River, Florida.

484. *PAMPHILA YUMA* EDW.

YUMA SKIPPER.

Ochre yellow above, unspotted, dusky on upper margin of fore wing. Dash, long, narrow, and nearly straight; pale dusky beneath, at base of fore wing. Expands 1.20. Found in Arizona.

485. PAMPHILA NEMORUM Bd.

PACIFIC SKIPPER.

Similar to *P. sylvanoides*, but the border is wider and the mark on fore wing at end of dash is prolonged to the apex in the form of a streak. Deep yellow beneath, spots repeated on fore wings, hind pair, unspotted. Expands 1.30. Found in California.

486. PAMPHILA SYLVANOIDES Bd.

CALIFORNIA SKIPPER.

Size, medium. Orange above, brown-bordered, with a band of yellowish spots crossing outer portion of wings, and a single spot near base. There is a blackish streak at base of dash. Beneath, pale yellow, slightly grayish on hind wing; spots repeated on fore wing. On hind wing are five spots; on under side of female, near outer portion of wing, is a black triangular spot, followed by a small, white, translucent spot, and at apex are three small yellow spots. Expands 1.30. Found in California, Nebraska, Colorado, and Washington.

487. PAMPHILA AGRICOLA Bd.

FIELD SKIPPER.

Dusky above, with a black mark from dash to apex of fore wing, with a row of yellow dots between this and the border, which is not very wide. On hind wing, border wider, more or less brown at base; beneath, yellow on fore wings with the mark less prominent than above; also yellow on hind wings with a slightly indicated band of paler. Expands 1.25. Found in California, Nevada, and Washington.

488. PAMPHILA MILO Edw.

BROAD-BORDERED SKIPPER.

Bright reddish orange above, bordered nearly to cell on fore wing with pale brown. Dash, a black, narrow, ridge, nearly straight, bent down a little, and edged on both sides with black scales. On upper margin are three small translucent spots, and two next dash; on hind wings the bordering is narrower and darker. Beneath, on fore wings, pale rusty, spots repeated, not enlarged; a black wedge indicates the end of dash, and the base is black. Hind wings, pale rusty, lighter in middle. Expands 1.20. Habitat. Mt. Hood, Oregon.

489. PAMPHILA PRATINCOLA Bd.

MEADOW SKIPPER.

Bright yellow above, with a few small spots only for a border, consisting of dusky triangles at ends of veins, and there is a blackish streak at apex. Yellow beneath, unspotted, excepting a small pale spot near apex of fore wing. Female, larger, with a serrate blackish border, and there is an oblique blackish band on fore wing, surmounted at apex by a spot of same color. Beneath, much as in male, but differs in having an irregular row of pale spots on hind wings. Expands 1.25. Found in California and Washington.

Fig. 55.



Illustrating the genus *Pamphila* lower side, hind wing; a, *massasioti*; pocahontas (fore wing); c, *nevada*; d, *colorado*; e, *sassacus*; f, *columbia*; g, *manitoba*; h, *juba*.

490. PAMPHILA VERUS Edw.

HAVILAH SKIPPER.

Yellowish orange above, bordering pale dusky, broadest on fore wings, narrower on hind pair; three indistinct spots in apex of fore wings, and a series of small spots in an oblique line outside edge of cell. Dash, black, slender, broken at lower branch of middle vein, but not separated, and somewhat edged with black on either side; on upper end, a dusky patch connects it with the dark margin. Beneath, both wings are yellowish orange; hind wings unspotted; fore wings have a little black at base, and a black streak represents dash; the indistinct spots are repeated, but paler. Female, similar, but paler, with spots clearer. Expands 1.00. Found at Havilah, California.

491. PAMPHILA CAMPESTRIS Bd.

PRAIRIE SKIPPFR.

Size and form similar to those of *P. nemorum*. Yellow above, rather widely brown-bordered, and yellow-fringed. On apex of fore wings are two or three yellow dots, and there are some dusky spots on middle of hind wings; beneath, pale yellow, spots repeated on fore wings, and there is a row of small spots crossing hind wings. Found in Southern California.

492. PAMPHILA HURON EDW.

HURON SKIPPER.

Size, medium. Dark golden yellow above on fore wings. Dash, pointed outwardly, wider at base, and in a rounded velvet black patch; at end of dash between it and the margin is a dusky patch. Hind wings with the central portion yellow. Dull yellowish orange beneath, grayish-tinged on hind wings, and at apex of fore pair, where the basal half and lower border is blackish, and there is a faint sub-marginal band. Base of hind wings dusky, with a faint sub-marginal band. Female, dusky tinged, fore wings yellowish at base and along upper border with a sub-marginal row of spots, hind wing yellowish, with a wide band not reaching either margin; beneath, on fore wing like male with the hind wings hoary, two curved rows of white confluent spots. Expands 1.20 to 1.50. Found in the Atlantic States south of New England to Florida, up the Mississippi Valley and in Texas and Arizona, Fig. 56, b.

493. PAMPHILA PHYLAEUS DURY.

WEDGE-MARKED SKIPPER.

Size, medium. Bright orange above; bar at end of central cell of fore wing with two longitudinal lines from it outwardly, and a series of brown marginal wedge-shaped spots, smallest opposite cell, Fig. 56, c. Dash, black and somewhat curved, and a little dusky beneath it. Hind wings brown-bordered all around, separated on outer margin, broken at lower vein, and nearly or quite at the lower branch of the middle vein, and the spot thus isolated is large, and sends a line back through the middle of the interspace to the base. Beneath, pale orange yellow, dusky at base, and along the lower border of fore wing, dash represented by an oval patch, narrow bar at end of cell, and the marginal wedges have the points represented only, there being a clear space between these and the margin. On hind wings is a large oblong dusky patch near lower margin and two rows of spots crossing wing, all small. Female, brown, marked with pale orange as follows: on fore wing, three spots at apex, two below these, two within them at end of central cell, and an oblique band of spots below these. On hind wings, an arrow-shaped band of spots with arms, nearly reaching the upper and lower borders, and within, near base, a spot. Beneath paler, spots repeated, enlarged, and pale. Expands 1.25 to 1.40. Found in the Middle and Gulf States to the Pacific.

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494. PAMPHILA BRETTOIDES EDW.

DOLL'S SKIPPER.

Similar to *P. brettus*, but differs above, in having no brown mark between the dash and the outer margin, and the outer margin to both wings have the brown border without the wedge-shaped projections. There are two small dusky marks within border near apex of fore wing; beneath, the fore wings have the base only black, and the two marks at apex repeated, otherwise unspotted. On hind wings is one row of spots only, within it three other spots. Expands 1.30. Found in Texas and Arizona.

495. PAMPHILA BRETTUS Bd-LEC.

BLACK-SPOTTED SKIPPER.

Dull orange above, with a serrated border on fore wings, and a wide border all around on hind wings. On fore pair the dash is short, straight and is surrounded with a large oval, velvety black patch, from it two dusky lines run to base, and a divided curved line on apex, Fig. 56, d. Beneath, spotted as in *P. phylaeus*, but the spots are larger and the dusky of base of fore wing extends along lower border to margin. Female, very similar to that of *P. phylaeus*, but differs in having the spots smaller and more isolated, those on hind wings above being indicated only, narrow beneath, where all spots are paler than in *phylaeus*. Expands 1.15 to 1.25. Found in the Gulf States and West Virginia.

496. PAMPHILA CHUSA EDW.

ARIZONA SKIPPER.

Yellowish orange above, with a narrow serrated dusky border to both wings, with two serrations wanting opposite cell on fore wings. Dash, velvety black, thick, curved, at its basal end is a small spot and a small dark patch outside; beneath, paler, unspotted. Expands 1.00. Found in Arizona.

497. PAMPHILA DRACO EDW.

DRAGON SKIPPER.

Size, medium. Dark brown above, orange on upper margin and in middle of wings. Fore wing with a yellowish spot in apex, two small spots at end of cell, and a larger one below these. Dash, narrow and doubly curved, velvety black at end. Outside it, is a larger dusky patch. Beneath, on fore wings blackish at base, and on lower margin; orange in middle of wing, and on upper margin; grayish at apex and outer margin; spots as above. Hind wings grayish orange, with a yellowish band of regular spots, beginning on middle of upper margin, bends at right

angles below apex, near margin, then two-thirds across wing, turns to the middle and runs through cell to base. Female, similar above, but the spots are larger with those on lower side of hind wing repeated above. Beneath, on fore wing orange on middle and near margin; the upper and sub-marginal spots are clear white, central spots yellow. Hind wings, greenish, with clear white spots not connected, and the band is bent as in the male. Expands 1.30. Found in Colorado.

498. *PAMPHILA SABULETI* Bd.

SAND SKIPPER.

Orange yellow above; widely brown bordered. Dash very short, and joined to a grayish spot. Beneath, paler, with a row of brown streaks, inclined to be arrow-shaped, crossing both wings, and there is a second row near base on hind wings. Female, larger and paler, with a row of paler spots between end of cells and outer border. Expands 1.25. Found in California.

499. *PAMPHILA OTHO* Sm-Abb.

YELLOWISH-BROWN SKIPPER.

Size, medium. Yellowish brown above, with a series of yellow spots crossing outer portion of fore wing, and two small spots at end of cell on hind wings. Beneath, the spots are repeated on fore wing, excepting the lower, and there are five or six spots in a band on hind pair. Dash, much as in *P. metacomet*. Expands 1.15 to 1.40. Found in the Southern Atlantic States, Mississippi Valley, and Texas.

501a. *PAMPHILA OTHO EGEREMET* Scud., is darker than the type, and lacks the lower spots on fore wing above, and the two spots on hind pair. Found in the Northern Atlantic States and Ontario.

500. *PAMPHILA PECKIUS* Kirby.

PECK'S SKIPPER.

PLATE X, 4.

Size, small. Brown above, orange-marked as follows; a patch above dash to upper margin, and base, and along lower margin as far as end of dash, in a narrow line, three spots in apex, two below these nearer margin, and two at end of dash, a large patch in middle of hind wing, and a dot in cell. Dash, black, slightly curved on lower side and followed basally by a dot of velvety black. Beneath, strongly orange-tinted, obscuring the brown; dusky at base of fore wing, and along lower border, spots repeated, enlarged; on hind wing central patch repeated, enlarged, and there is a second basal patch, joined to outer at two points;

all spots are yellow. Female, lacks the orange about base of fore wing, and has the six outer spots only. and the patch on hind pair is faintly indicated. Beneath, similar to male, but with the spots smaller, that on base of hind wing separate and there is more dusky on fore pair. Expands 1.00 to 1.10. Found from New England to Wisconsin, and in West Virginia, Ontario, and Quebec. Occurs in June, July, and August.

501. *PAMPHILA MYSTIC* Lcud.

ORANGE SKIPPER.

Generally similar to *P. sassacus*, but differs in having the dash wider, without the shining central division, and dusky spot at end is not divided, nor extended as far into the border, Fig. 56, e; on hind wing there is a dusky patch on the orange at base, beneath, more orange-tinted, and there is a dusky mark at end of each cell. Female differs from that of *sassacus* in having the markings more restricted and deeper in color. Expands 1.10 to 1.25. Found in New England, New York, Ontario, and Quebec. Occurs in June.

504. *PAMPHILA SIRIS*.

SIRIS SKIPPER.

Size, small; dark brown above, orange on basal half of fore wings; there are three orange spots in apex, and an oblique row of three spots across end of wing. Dash, narrow, with a deep brown patch behind. There is a rather dull orange band on hind wing, curved and narrow, not distinct, excepting in middle of wing, and within this is an indistinct spot. Beneath, brown on fore wing, with orange repeated, but dull; spots repeated, more yellow, and there is a fourth spot in oblique band. Hind wings also brown with a row of yellow spots, and there is a long spot in cell. Female, similar with spots clearer, the oblique line with four spots above and the under side is more overwashed with orange. Expands 1.15 to 1.28. Found at Puget's Sound, Washington.

501. *PAMPHALA MARDON* Edw.

WASHINGTON SKIPPER.

Quite similar to *P. agricola*, differs in having a broader fore wing, is of duller color, and without a dusky patch between the end of the dash and apex. Expands 1.00 to 1.10. Found at Puget's Sound, Washington.

504. PAMPHILA CERNES Bd-LEC.

CLEAR-WINGED SKIPPER.

Yellowish brown above, with a patch of reddish orange in middle of upper portion of fore wing, above dash, this extends into a point toward apex and just below its termination are two small spots and another at end of cell, Fig. 56, f. Hind wings, unspotted; beneath, brown, overwashed with orange, markings repeated on fore wing a little enlarged. Female, with only a trace of the orange on fore wing, and with two extra spots on outer portion of wing, forming an oblique band, and two small ones at end of cell. Expands 1.00 to 1.10. Found from New England to Montana; in British America, Ontario, Quebec, and Florida. Occurs in May and June in the north.

505. PAMPHILA MANATAAQUA Scub.

YELLOW-SPOTTED SKIPPER.

Size, medium. Brown above, orange-tinted on middle of hind wings which are unspotted; in middle of fore wing is a patch of orange, surrounding the dash, Fig. 56, g. At apex are often two indistinct dots of orange. Dash, black, and consists of two oval portions, the basal slightly curved. Beneath, strongly overwashed with rusty orange, especially on upper border of fore wing. There is a patch of black at base of wing, which sends a dusky line along the lower border, and the orange patch is represented by two or three orange spots in an oblique bar. Female, paler brown, with three pale spots in apex of fore wing, and three others in an oblique bar. Beneath, paler, slightly tinted with rusty, spots excepting lower, repeated. Expands 1.15 to 1.25. Found throughout the United States and British America. Occurs in Massachusetts in July.

506. PAMPHILA VERNA Edw.

DARK BROWN SKIPPER.

Size, medium. Dark brown above, with a slight purple reflection. Fore wings with the upper margin sprinkled with yellow, there are three small, yellowish, translucent spots in a line from upper border, about three-fourths the distance from base to apex, two larger spots in middle of outer portion, and a small spot in cell nearer end. Dash, black, narrow, a little constricted, but not broken. No spots on hind wings. Beneath, colored as above, but tinged with bronzy yellow; spots on fore wings repeated, and there is a row of five indistinct spots on hind wings. Female, quite similar. Expands 1.25. Found in New York, and from Maryland to Georgia, in West Virginia, Ohio, Indiana, and Kansas.

507. *PAMPHILA MORRISONII* Edw.

MORRISON'S SKIPPER.

Similar to *P. brettus*, but differs in having the spot at end of dash larger and oval; the dash is without the accompanying velvety patch, and the marginal band is not serrated, being brown-edged only; on hind wings is an orange, arrow-shaped mark. Beneath, much suffused with reddish brown, with a band crossing outer portion of fore wings whitish above, yellowish below. Hind wings, rusty, dusted with dull orange; band repeated in pure white; in cell a white line extends from base to extremity. Female, similar. Expands 1.30. Found in Southern Colorado and Arizona.

508. *PAMPHILA METACOMET* HARR.

IMMACULATE SKIPPER.

Size, medium. Deep brown above, with bronzy reflections; dash, curved and divided in the middle; no markings. Paler beneath, with the spottings seen in the female indicated. Female, same color, with two small spots in apex, and two below these on fore wings above, they are a little clearer below, where both wings are slightly whitish at base; a slightly indicated band of spots on hind wings. Expands 1.15 to 1.25. Found from New England to Montana, and in Kansas, Montana, Nevada, Ontario, and Quebec.

509. *PAMPHILA VESTRIS* Bd.

VESTRIS SKIPPER.

Similar to *P. metacomet* in color, unspotted, and in having a slight washing of yellowish along basal half of fore wings. There are no indications of markings below. Female has no spots in apex of fore wing on either surface. Expands 1.28. Found in California, Colorado, and on Indian River, Florida.

510. *PAMPHILA BELLUS* Edw.

BELLUS SKIPPER

Dark brown above, fringed with orange. Dash, long, narrow, and straight. Beneath, paler, overwashed with greenish. No markings on either surface. Palpi, orange. Expands 1.20. Found in Southern Arizona.

511. *PAMPHILA ACCIUS* SM-ABB.

WHITE-SPOTTED BROWN SKIPPER.

Blackish brown above. Dash, oblique and black, at outer end is a white dot, and three white dots near apex. Reddish brown beneath, overwashed with whitish on outer portion of both wings; spots repeated. Female, similar, with an oblique line of white spots at end of fore wing, and a dot at end of central cell. Expands 1.40. Found in North Carolina, the Gulf States, and rarely in Eastern Pennsylvania and New England.

512. *PAMPHILA LOAMMI* WHITN.

LOAMM'S SKIPPER.

Dark glossy brown above, darker basally; there are three whitish spots in apex of fore wings, and two spots on outer portion of wing, upper, largest. Dash, narrow, black, divided, upper portion, straight, lower curved. Hind wings, unspotted. Dark chestnut brown, beneath; apex of fore wings and outer border of hind pair, overwashed with whitish. Spots repeated on fore wing. On hind wings is a curved row of three small, irregular spots near base, and a sub-marginal row of six spots, all spots on hind wing, black-bordered. Female, paler. There are two spots at end of cell on fore wing, and two extra spots on outer portion. Markings on hind wing below much as in male. Expands 1.30 to 1.50. Found in Florida and North Carolina.

513. *PAMPHILA HORUS* EDW.

HORUS SKIPPER.

Brown on both surfaces, darkest near base, lighter on middle. Fore wings, with two or three whitish dots near apex, and indications of spots near outer margin. Expands 1.50. Found in Texas.

514. *PAMPHILA DEVA* EDW.

DEVA SKIPPER.

Similar to *P. lunus*, but differs in being larger, in having larger spots, in being grayer beneath, in having one brown dash only across hind wing beneath, and in having the fringes of this wing white. Expands 1.10 to 1.20. Found in Southern Arizona.

515. *PAMPHILA LUNUS* EDW.

WHEELER'S SKIPPER.

Dark brown above, with bronzy reflections; fore wings have three small spots near apex, white and translucent, a large spot at end of cen-

tral cell, below this and outside it, is a small spot and another below this, but nearer base, thus these last three named form a triangle. Hind wings, unspotted. Brown beneath, with apex of fore wings and hind pair overwashed with grayish, spots repeated on fore wings and on hind pair are two brown dashes in middle, and within a thin white streak. Fringes of hind wings yellow. Female, similar, but lacks the white streak. Expands 1.40 to 1.50. Found in Southern Colorado and Arizona.

516. *PAMPHILA MACULATA* Edw.

SPOTTED SKIPPER.

Dark brown above; on fore wings are three small spots near apex, two below these opposite cell, and another below these; hind wings with a small spot in middle, all spots semi-transparent, and yellowish. Beneath, similar, washed with white on apex of fore wings. Expands 1.40 to 1.50. Found in the Gulf States, rarely in New York.

517. *PAMPHILA PANOQUIN* Scud.

PANOQUIN SKIPPER.

Brown above with a bronzy luster; two spots only in apex of fore wing and usually one or two below, beyond cell, below these is an oblique row of three spots, and a small spot in cell, all pale yellowish. Dash, small and oval, parallel with the upper margin. Beneath, similar, overwashed with bronze along upper margin of fore wings, and on veins of hind pair. On outer part of hind wings is a white line with a spot below it, and occasionally one above. Female, similar. Expands 1.20 to 1.30. Found in the Gulf States and at Atlantic City, New Jersey.

518. *PAMPHILA OCOLA* Edw.

OCOLA SKIPPER.

Dark brown tinged with bronze. One or two small spots in apex, and three others below these in a bent row, all dull, dusky, translucent yellow. Beneath, similar, bronzy on upper and outer margin of fore wings, and along veins of hind pair, spots repeated. Female, similar, spots, larger. Expands 1.40. Found in the Gulf States, Eastern Pennsylvania, and at Whitings, Indiana

519. *PAMPHILA ETHLIUS* Cram.

LARGE BROWN SKIPPER.

Size, very large; blackish brown above, slightly overwashed with yellow on outer portion of both wings. Fore wings with seven whitish

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EXPLANATION OF FIGURES ON PLATE X.

1. *Lycaena pseud . . .* 2. *Carterocephalus mandan.*
3. *Ancyloxyphia numitor.* 4. *Copaeodes wrightii.* 5. *Thymel-*
icus garita. 6. *Pamphila peckius.* 7. *Amblyscirtes vialis.*
8. *Pyrgus tessalata.* 9. *Nisoniades juvenalis.* 10. *Pholisora*
catulus. 11. *Eudamus pylades.* 12. *Erycides urania.*

PLATE X.



1



2



3



5



4



6



7



12



8



10



9

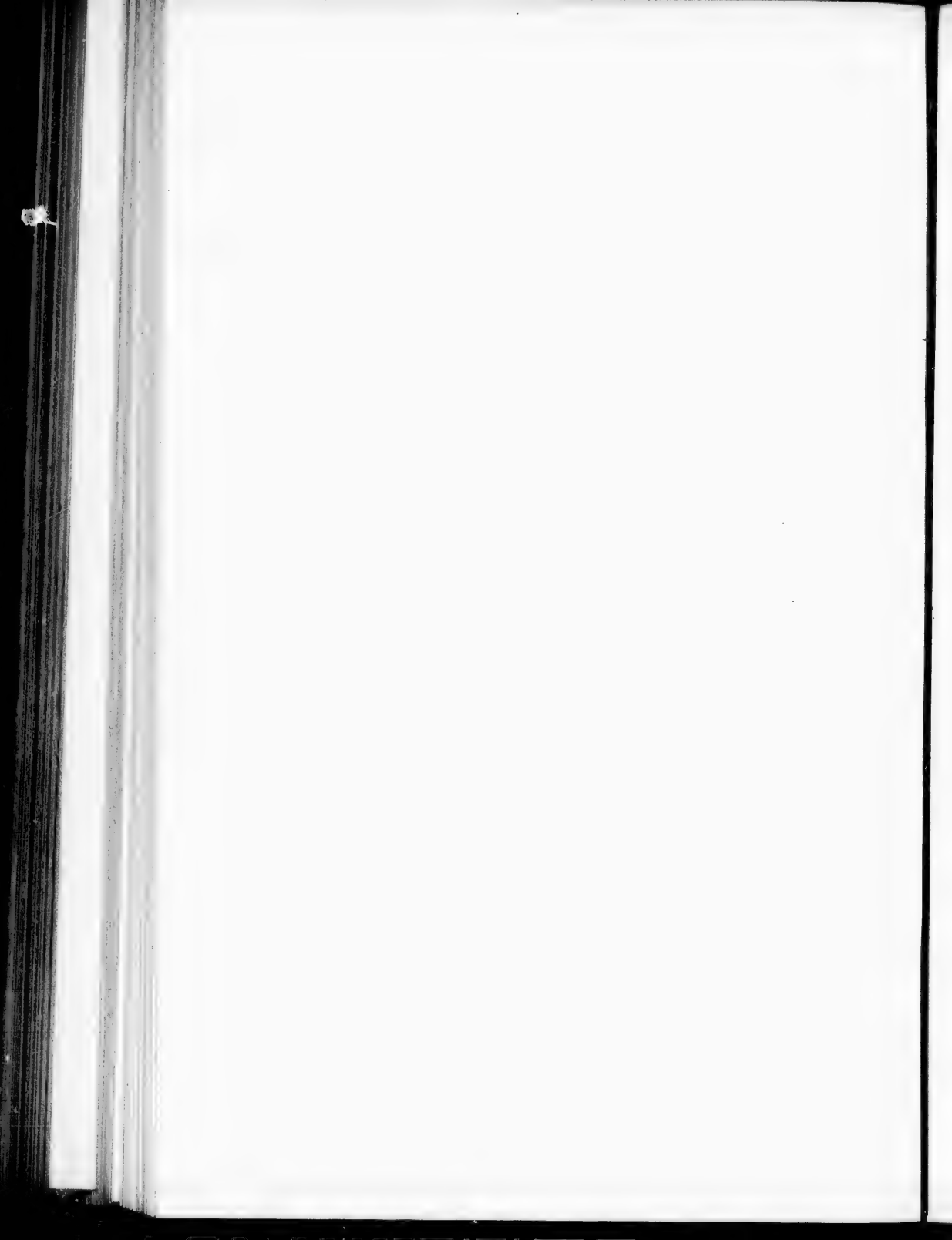


11

North American Butterflies.

C. J. M.

mandan.
Thymel-
es vialis.
Pholisora
a.



translucent spots shown in Fig. 56, i, and three on middle of hind pair. Beneath, ochreous brown, with spots repeated. Female, similar.

520. *PAMPHILA PITTACUS* EDW.

GREENISH SKIPPER.

Pale brown above, thickly overwashed with grayish green, with translucent spots as follows; three in apex of fore wings, one large, at end of cell, and three in an oblique row across wing; on hind pair a row of four, nearly confluent. Lower side brown, hoary on apex and upper margin of fore wings, and on whole of hind pair; spots repeated, and there are three obscure whitish spots extra on hind wings. Female, lacks all but the outer spot on hind wings, otherwise similar. Expands 1.50. Found in Arizona.

521. *PAMPHILA BIMACULA* GR-ROB.

TWO-SPOTTED SKIPPER.

Dark brown above, with two spots of yellowish on outer portion of fore wing; dash, narrow, black, divided in the middle into two elliptical parts. Beneath, grayish, heavily tinted with rusty yellow, spots as above; fringes, white, gray at base. Female, quite similar, but less gray beneath. Expands 1.20 to 1.50. Found from New England to Nebraska, and in Illinois.

522. *PAMPHILA PYTHON* EDW.

PYTHON SKIPPER.

Similar to *P. pittacus*, but is more yellow above, and lacks the band in middle of hind wing, and there are two small yellow spots, near upper angle, also white-fringed, not gray, on hind wing. Beneath, are two small white spots on upper portion and a bent row of five small, white spots in middle. Expands 1.50. Found in Arizona.

523. *PAMPHILA CESTUS* EDW.

CESTUS SKIPPER

Upper side brown, thickly overwashed with yellowish green. On fore wings are seven semi-transparent spots, three at apex, three below and one in central cell, having a deep angular incision on either side. On hind wings is a similar spot in cell, and four larger ones outside in a band. Beneath, mottled greenish gray and brown, spots repeated, enlarged, and on hind wings five spots are confluent, and there are two in addition near upper border. Expands 1.50. Found in Southern Arizona.

524. PAMPHILA RHENA EDW.

RHENA SKIPPER.

Light brown above, with base and central portion of fore wing yellowish orange, somewhat reddish along upper margin; three small indistinct spots near apex of fore wing. Dash, long, narrow, and velvety black. Hind wings, with an obscured orange patch in the middle. Yellowish brown beneath, on both wings, overwashed with yellowish. Upper margin of fore wing, to below cell, yellowish orange; spots repeated, more distinctly; there is a black, triangular patch, followed by an oblique bar of yellowish spots; on hind wings the spots are faintly defined, and there is a row of small black spots parallel to outer margin. Expands 1.30. Found in Southern Arizona.

525. PAMPHILA PONTIAC EDW.

PONTIAC SKIPPER.

Dark brown above, with a central patch on fore wing of yellowish orange, that contains the wide velvety black dash; this is divided in the middle into two oval, about equal parts; three spots in apex. On hind wings, is an orange patch in the middle, divided by the veins. Beneath, much overwashed with rusty orange, with the spots repeated, and the fore wing marked much as in *P. cernes*. Central spot on the hind pair showing faintly. Female, darker, with three spots in apex, and three on outer portion of fore wing, and the central spot on the hind pair is much restricted; overwashed below with rusty orange, with spots repeated. Expands 1.60 to 1.80. Found from Massachusetts to Nebraska, and in New Jersey. Occurs in July.

526. PAMPHILA DION EDW.

DION SKIPPER.

Very similar to *P. pontiac*, but the yellow is more restricted and clearer; the division of the dash is more distinct, and there is more yellow on hind wing. Ochreous yellow beneath, brown-tinged, with spots obscured, and there are no spots on hind wings. Female, with a small spot at end of cell above, otherwise as in *pontiac*; beneath, similar to the male. Expands 1.60 to 1.80. Found in Nebraska, and at Hamilton, Ontario.

527. PAMPHILA ARPA BD-LEC.

ARPA SKIPPER.

Brown above, greenish-tinged; base of fore wings, and patch along upper border, yellowish; cell and space containing dash, clear golden

yellow. Dash, long and slender, a little constricted in middle, black; hind wings with a little yellow in middle. Beneath, dark golden yellow, outer portion of fore wing blackish, where there are three pale spots. Hind wings, unspotted. Female, same brown above, with a little yellow at base, with some markings of yellow at apex of fore wings. Below as in male. Expands 1.60 to 1.80. Found in the Gulf States.

528. *PAMPHILA PALATKA* EDW.

PALATKA SKIPPER.

Clear yellow above, darker at base of fore wing, and broadly brown-bordered on both wings, and also on upper margin of hind pair. Beyond cell on fore wing are three yellowish spots. Dash, narrow, broken in middle, dull black. Beneath, brown on hind wings, and outer portion of fore pair, overwashed with rusty. Yellow of fore wings repeated; hind pair without spots. Female, similar, but has more orange on fore wing below. Expands 1.45 to 1.50. Habitat, Gulf States and Nebraska.

529. *PAMPHILA MELANE* EDW.

MELANE SKIPPER.

Brown above, more or less orange-tinted, especially at base of fore wings and on hind pair. Three spots near apex, a fourth, minute, below this, and separate; two larger, angular spots on middle of wing, and another on lower margin, thus all forming an irregular row across wing; there is a row of indistinct spots nearly parallel to outer margin. Beneath, brown, yellow-tinted, most thickly on hind wings. Spots on fore wings repeated, enlarged; on hind pair is a broad yellow band. Female, similar, but spots on hind wings narrower and on fore wings larger. Expands 1.30 to 1.40. Found in California.

530. *PAMPHILA VITELLIUS* SM-ABB.

ORANGE-PATCHED SKIPPER.

Clear orange above, both wings bordered with brown, hind wings widely all around, fore pair, broadly outwardly, more narrowly on lower margin and very narrowly on upper. Beneath, paler yellow, dusky along lower margin of fore wing. Female, similar, but with bordering wider. Habitat, Georgia, Florida, Southern Texas, Iowa, and Nebraska.

531. *PAMPHILA DELAWARE* EDW.

YELLOW-WINGED SKIPPER.

Similar above to *P. zabulon*, but clear yellow below, without borderings nor spots. Female, brown above with a band of about ten pale

yellow spots crossing end of wing, similar to male beneath. Expands 1.20 to 1.35. Found from Massachusetts to Florida, and in Illinois, Kansas, and Montana.

532. PAMPHILA LAGUS EDW.

NARROW-BORDERED SKIPPER.

Yellowish orange above, both wings narrowly dusky bordered, a little widest on fore pair. There is a black line at end of cell on fore wing, and a line above it; fringes, pale orange. Beneath, as in *P. delaware*, Expands 1.00. Habitat, Western Texas and Southern California.

533. PAMPHILA BYSSUS EDW.

BYSSUS SKIPPER.

Dark glossy brown above, rusty on basal half of upper margin of fore wings above; orange marked as follows, at end of cell a bar, outside this a bent band, extending from upper border to near the lower margin, widening below to nearly one third the length of wing. Outer half washed with orange. Hind wing with an orange patch in middle. Beneath, wholly rusty, spots repeated, indistinctly on fore wing, and either not at all on hind pair, or very faintly. Female, similar, but the band on fore wing is narrower and shows more distinctly on hind pair beneath. Expands 1.60 to 1.70. Habitat, Indian River and Texas.

534. PAMPHILA PHYLACE EDW.

DARK BROWN SKIPPER.

Dark brown on both surfaces unmarked, washed with whitish beneath, on apex of fore wings and on whole of hind pair. Expands 1.20. Habitat, Southern Colorado and Arizona.

535. PAMPHILA OSYKA EDW.

SMALL BROWN SKIPPER.

Brown on both surfaces, unmarked; dash, long, depressed in middle, broadest on under part. Female, similar above, beneath, clear gray, brown on outer margin of fore wing, where there are three minute, translucent spots in a line. Expands 1.10. Found in the Gulf States and at Whiting's Indiana.

536. PAMPHILA COMUS EDW.

COMUS SKIPPER.

Light glossy brown above; on fore wing three small white spots in line near apex, below these a still smaller spot; hind wings unspotted.

White-fringed on hind wings, excepting at end of veins, brown on fore pair. Beneath, paler, spots repeated on fore wing; hind wing wholly dusted with gray; on outer margin is a row of five small white dots, two similar spots on upper margin and one in cell. Expands 1.10. Habitat, Texas and Southern Colorado.

537. *PAMPHILA EUFALA* EDW.

GREENISH-BROWN SKIPPER.

Dark greenish brown above; on fore wings are three small white translucent spots near apex, and two, also small, below these a second oblong and twice as large as the other one, and usually one or two whitish dots at end of cell. A little paler beneath, apex of fore wings, and whole of hind pair sprinkled with gray. Female, similar, slightly violet-tinted above and below. Expands 1.10 to 1.20. Found in Florida and Texas.

538. *PAMPHILA ARABUS* EDW.

ARIZONA BROWN SKIPPER.

Dark glossy brown above; on fore wings are three small spots in line, two oblique below, all translucent, below these a white dot and another in cell; brown-fringed. Beneath, brown, gray on apex of fore wing and on hind pair, brown in middle of wing. Expands 1.30. Found in Arizona.

539. *PAMPHILA FUSCA* GR-ROB.

BLACKISH SKIPPER.

Greenish black above unspotted, pale fringed. Beneath, overwashed on apex and outer portion of fore wing and on whole of fore pair with golden brown scales. Female, similar. Expands 1.15. Found in the Gulf States.

540. *PAMPHILA NEREUS* EDW.

NEREUS SKIPPER.

Dark greenish brown above, with a band of small white spots on outer margin of fore wings. Brown beneath; apex of fore wings, and whole of hind pair, thickly covered with grayish yellow scales; on hind wings an irregular row of small, indistinct whitish spots, following margin around upper border. Female, similar, with spots less conspicuous. Expands 1.10. Found in Arizona.

541. *PAMPHILA HIANNA* Scud.

FOUR-SPOTTED BROWN SKIPPER.

Dark brown above; three spots near apex of fore wings, one larger below and another, small, in end of cell, all white. Brown, below, overwashed with gray at apex of fore wings, spots repeated, and there is a pale curved line in middle of wing; on hind wing are two small spots on upper margin. Female, differs in spots being larger, in having in addition two spots opposite cell on fore wings, and a larger spot below others on outer portion, and a small spot on hind wing near base. Expands 1.30 to 1.45. Found from Massachusetts, (where it is rare) to Nebraska.

542. *PAMPHILA VIATOR* Edw.

VIATOR SKIPPER.

Dark brown above on fore wing, reddish-tinted. There is a double yellow spot in end of cell, and a row of spots across wings. Hind wings have a broad brown margin, narrowest on inner margin, the remainder of wing yellow, broken into long spots by the veins. Beneath, smoky on outer margin of fore wing, reddish along upper margin and at apex, spots repeated indistinctly, and sometimes there are two spots beyond cell. Female, similar. Expands 1.50. Found in the Gulf States and rarely in Massachusetts, New Jersey, Illinois, Wisconsin, and Hamilton, Ontario.

GENUS LIX.

AMBLYSCIRTES. LITTLE BROWN SKIPPERS.

Size, small. Color, dark brown with no prominent markings. Fore wing long, narrow, and somewhat angled. Hind wings, short and rounded. Antennae, long, with terminal process bent outward at right angles. TYPE, *A. VIALIS*. (Plate X, 7.)

543. *AMBLYSCIRTES VIALIS* Edw.

TWO-SPOTTED BROWN SKIPPER.

Dark brown throughout, purplish-tinged below, with two white dots near apex of fore wings. Expands .80 to 1.00. Found at Orino, Maine, and in the Middle, Southern and Western States.

544. *AMBLYSCHIRTES NYSA* EDW.

TEXAS BROWN SKIPPER.

Dark brown above, yellowish-fringed, with three small transparent spots in apex of fore wing. Paler beneath, on fore wings, spots repeated; hind wings brown, black-clouded; there is a poorly defined band near outer margin, a patch in middle, and another on upper border, also dark at base. There are some grayish scales bordering patches near outer angle. Expands 1.10. Found in Texas.

545. *AMBLYSCHIRTES EOS* EDW.

EOS BROWN SKIPPER.

Grayish brown above, alternately white and orange-fringed; three spots in apex of fore wings. Beneath, also brown, whitish-tinged on apex of fore wing, along upper border, and on hind pair. Spots on fore wings repeated, with another below, nearer outer margin. On hind wings a double row of white dots along outer margin, a dot in cell and another above it. Expands 1.00. Habitat, Texas, Georgia, and Florida.

546. *AMBLYSCHIRTES SAMOSET* SCUD.

SAMOSET SKIPPER.

Dark brown above, with an interrupted yellowish fringe; four spots in apex of fore wings, the upper a little nearer base than the others. Beneath, brown, overwashed with whitish on hind wings, and on apex of fore wing; spot on fore wing repeated, enlarged; there is another outside the four, two spots of yellowish in center of wing, and two more below these; hind wings spotted with dusky.

547. *AMBLYSCHIRTES AENUS* EDW.

AENUS SKIPPER.

Brown above, yellowish-tinted; on fore wings is a series of small yellow spots, beginning on upper margin, near apex and passing around end of dash, and then back of same to lower margin; dash represented by a slight thickening and bulging of the surface. Fringes white, interrupted by brown. Beneath, darkest toward apex of fore wing, yellowish at base, dusted with grayish. Hind wings dusted with grayish, and there is a band of small gray spots on outer portion, and two or three spots towards base. Female, similar, but paler. Expands 1.10. Habitat, Western Texas, Southern California, New Mexico, and Arizona.

548. *AMBLYSCIRTES SIMIUS* EDW.

SIMIUS SKIPPER.

Grayish brown above, with a silky gloss. On fore wings is a pale orange dot at end of cell, and a bent row of orange spots across wing; on hind wings a trace of a narrow band. Beneath, orange in cell of fore wing, grayish on outer portion, spots repeated. Pale yellowish brown on hind wings, with a whitish band crossing outer portion, and a white patch at base below cell. Female, paler, spots not as distinct. Expands .85 to .95. Habitat, Southern Colorado and Arizona.

549. *AMBLYSCIRTES CASSUS* EDW.

CASSUS SKIPPER.

On fore wings above, brown, dusted with orange most thickly along lower border. Three spots near apex, an oblique row below these, and a bar at end of cell from which a line runs toward base; all pale orange. Dash, short, narrow, bent at outer end. Hind wings dull orange with the upper border dusky. Fore wings below, orange, dusky along lower margin, gray at apex; spots repeated; hind wings dark brown, whitish overwashed; a row of indistinct whitish spots near outer margin, two whitish spots near upper angle, two in middle of wing and another at base. Female, duller; spots paler. Expands 1.00 to 1.50. Habitat, Mt. Graham, Arizona.

550. *AMBLYSCIRTES NANNO* EDW.

NANNO SKIPPER.

Brown, thickly overwashed with orange; three white spots in apex of fore wing, and four small spots in an oblique line below these; on hind wings a row of small, indistinct spots, yellowish; fringes of fore wings, interrupted white, on hind wings, white. Under side of both wings dark brown, much dusted with white, spots on fore wings, repeated, and an additional spot in cell, hind wings have a curved row of small white spots beginning near base of upper margin and passing this and around outer margin, and a spot in cell. Expands 1.30. Habitat, Arizona.

551. *AMBLYSCIRTES TEXTOR* SCUD.

EASTERN BROWN SKIPPER.

Greenish brown above; on fore wing is an irregular row of six small angular, white spots, extending from upper border to middle near outer border, hind wings, unspotted; whitish-fringed. Beneath, similar, spots more distinct with two minute spots at end of cell on fore wing; hind wings with a grayish violet tint, except near lower margin, and there

is a row of yellowish white spots crossing wing; across end of cell is another somewhat broken row, the two lines being connected by white veins. Expands 1.15. Habitat, North Carolina to Texas.

GENUS LX. PYRGUS. CHECKERED SKIPPERS.

Size, small. Colors, dusky checkered with white. Wings, short and triangular. Antennae, short. Type, *P. TESSALATA*. (Plate X. 8.)

552. PYRGUS ERICETORUM Bd.

WHITE CHECKER.

White above, with a single row of marginal, arrow-shaped spots on fore wing, and two or three rows on hind pair. White, below, with two rows of brownish spots on hind wings, one marginal, the other at base. Female, blackish above, with two white bands, one of small arrow-shaped spots marginal, and one in middle of wing, wider and irregular. Habitat, New Mexico, Arizona, California, and Oregon.

553. PYRGUS OCEANUS Edw.

OCEANUS CHECKER.

Soiled white above; pale brown at base of wings, on apex of fore wings, extending to cell, suddenly narrowing there and running to lower margin, enclosing a series of whitish crescents; an oblique streak near apex. Hind wings, clouded with brown along lower margin and on middle. Outer margin narrowly edged with brown, enclosing a series of whitish serrations on margin. Under side of fore wings white, discolored with brown on upper and outer margin; four brown spots on apex, preceded by a short oblique line; hind wings pale brown, darker at base and on outer margin. Expands 1.60. Habitat, Arizona.

554. PYRGUS LOCUTIA Hew.

BROWN AND WHITE CHECKER.

White above with apex and outer margin brown. At apex is a white spot, and some minute spots near outer margin. Hind wing with outer margin and spots at end of veins brown. Beneath on fore wing similar, on hind pair there is a double spot at base of upper margin, a small spot on lower margin, and outer margin brown. Expands 1.20 to 1.50. Habitat, Texas.

555. PYRGUS NEARCHUS Edw.

ARIZONA CHECKER.

Upper side brownish black, grayish at base; on fore wings is a row of white dots and an incomplete sub-marginal row, distinct only next inner margin; on upper margin is a line of four white spots, outside these a double spot, and below this another spot; crossing both wings is a broad white band, on hind wings is a row of sub-marginal crescents; black and white fringed. Lower side pale greenish brown, spots repeated, upper margin whitish, hind wings clouded with greenish brown and whitish. Expands 1.20. Habitat, Arizona.

556. PYRGUS TESSELATA Scud.

TESSELATED CHECKER.

PLATE X, 8.

Brown above, brown and white fringed, four rows of white spots on fore wing, three on hind pair, the first outer dots, second larger, and the third large and nearly confluent. Beneath, paler, with spots enlarged. Expands 1.00 to 1.35. Habitat, Pennsylvania to the Gulf of Mexico and from the Atlantic to the Pacific, also British America.

557 PYRGUS CENTAUREAE Ramb.

BLACK CHECKER.

Black above, brown-tinged; a bar at end of cell on fore wings, a less distinct spot in cell and a sub-marginal row of spots and five spots on upper margin, all white. Hind wings with two obscure rows of white spots; a little paler beneath, spots repeated on fore wing, enlarged; on hind wings are three rows of spots. Expands 1.25. Habitat, New York, West Virginia, Colorado, and Labrador.

558. PYRGUS PHILETAS Edw.

TEXAS CHECKER.

Similar to *P. tessellata* above, and below on fore wings; hind wings beneath differ in being yellowish, in having no central band, the basal two-thirds of wing being whitish with a few brown dots and streaks, on outer margin are three rows of minute spots. Expands 1.20. Habitat, Western Texas.

559. PYGUS COESPITABIS Bd.

TWO-BANDED CHECKER.

Black above, with two bands of white spots, and two white spots

near base of fore wings. Beneath, paler, spots enlarged. Expands 1.25. Habitat, Colorado, Nevada, California, and Oregon.

560. PYRGUS XANTHUS EDW.

XANTHUS CHECKER.

Pale black above, white spotted; on fore wings a sub-marginal row, and a row within this; a spot at end of cell. On hind wings a marginal row of spots, and another within this, in cell, a streak. Beneath, dusky, grayish tinged; spots repeated, greatly enlarged and confluent; at base of cell on hind wing is a white spot. Expands .80. Habitat, Southern Colorado.

561. PYRGUS SCRIPTURA BD.

SMALL CHECKER.

Size, small. Brown above, with rows of small white spots, two white spots near base of fore wings. Under side of fore wings, whitish with spots distinct. Habitat, California, Arizona, and Montana.

562. PYRGUS NESSUS EDW.

NESSUS CHECKER.

Pale brown above; a black band crosses both wings, formed of longitudinal stripes, one to each interspace, and a narrow, more confluent band crosses basal area of hind wing; along outer margin is a dash of gray, in each interspace, not distinct. Three triangular spots on upper margin, and three others half way to apex. On middle of wing are two marks, forming a V-shaped spot, not quite joined at angle; hind wings have a similar spot near outer angle. Paler beneath, with spots repeated. Expands 1.00 to 1.10. Habitat, Coast to San Antonio, Texas.

GENUS LXI. NISONIADES. BANDED SKIPPERS.

Size, small to medium. Colors dark, nearly black with no prominent markings. Fore wings, triangular; hind wings, rounded. Antennae, with club curved. Fore wing of male furnished with a groove along basal portion, which is capable of opening. TYPE N. JUVENALIS. (Plate X, 9.)

563. NISONIADES BRIZO BD-LEC.

BLuish SKIPPER.

Dark brown above. Fore wings with two double, black bands, bluish centered; space between the two, yellowish, and between the outer

and margin are two rows of indistinct yellowish dots. Hind wings, with two rows of pale orange spots. Pale brown beneath, with three rows of pale orange spots on fore wing, the inner whitish, and two on hind pair. Expands 1.40 to 1.70. Habitat, Atlantic to Rocky Mountains, Colorado, Arizona, British America, Ontario, and Quebec. Occurs in May. Fig. 57, e.

564. NISONIADES ICELUS

SMALL BLUISH SKIPPER.

Similar to *N. brizo*, but is smaller, without light spaces on fore wings above; bands composed of spots, and there is one row only of spots on hind wings, and this is indistinct; beneath, are two rows on each wing. Expands 1.15 to 1.25. Habitat, New England to Michigan, Illinois, Florida, Colorado, Arizona, Washington, and Ontario. Occurs in early May in New England. Fig. 57, f.

565. NISONIADES SOMNUS LINT.

SOMNUS SKIPPER.

Size of *N. icelus* but darker, with two rows of paler spots showing on hind wings above, otherwise similar to *icelus*. Expands 1.30 to 1.40. Habitat, Indian River, Florida.

566. NISONIADES LUCILIUS LINT.

FIVE-SPOTTED SKIPPER.

Size of *N. icelus*, but darker with three minute spots near apex of fore wing, one below them, and one in end of cell, all more clearly seen below. Expands 1.30 to 1.40. Habitat, New England, Middle and Western States. Occurs in May. Fig. 57, g.

567. NISONIADES PERSIUS SCUD.

SIX-SPOTTED SKIPPER.

Similar to *N. lucilius*, differs in having three larger, more elongated spots in apex of fore wing, a minute one above these, and two below, none at end of cell. Expands 1.40 to 1.50. Habitat, New England to Montana, Washington, Colorado, and New Mexico. Fig. 57, h.

568. NISONIADES ALPHEUS EDW.

ALPHEUS SKIPPER.

Similar to *N. perseus*, but differs in having three spots near apex of fore wing, the middle of which is a little nearer the margin than the other two, and beneath these is a minute spot rather nearer margin

than any of the others, below all is a rather indistinct dot. Expands 1.10 to 1.20. Habitat, New Mexico, Arizona and Nevada.

569. *NISONIADES AUSONIUS* LINT.

SOUTHERN BROWN SKIPPER.

Similar to *N. perseus*, but lacks the spots in apex of fore wing. Expands 1.06. Habitat, Middle States and West Virginia.

570. *NISONIADES MARTIALIS* SCUD.

DARK-BANDED SKIPPER.

Differs from *N. perseus* in being very dark above, nearly black, in having four spots in apex of fore wing, upper minute, one at end of cell and two below, all these forming a kind of rude circle which encloses a lighter patch; on hind wings the spots are very distinct, in two rows, and there is a bar at end of cell. Expands 1.40 to 1.70. Habitat, Atlantic States to Florida, Mississippi Valley, Kansas, and Colorado.

571. *NISONIADES AFRANIUS* LINT.

DARK SKIPPER.

Dark as in *N. martialis*, with four spots in a line in apex of fore wing, two in cell with some grayish scales in space occupied by the whitish patch in *N. martialis*. Two rows of pale spots on hind wings. Expands 1.20. Habitat, Southern Colorado and Arizona.

572. *NISONIADES JUVENALIS* HARR.

SEVEN-SPOTTED SKIPPER.

Larger and paler than the last, with seven spots on fore wings as in the Plate X, 7. Spots, large. Only an indication of a bar at end of cell on hind wing above. Expands 1.35 to 1.55. Habitat, Atlantic States to Florida, Mississippi Valley, Colorado, Arizona, Ontario, and Quebec. Occurs with others in May.

573. *NISONIADES PETRONIUS* LINT.

FLORIDA BROWN SKIPPER.

Similar to *N. juvenalis*, but differs in being larger, spots on fore wing smaller, and the four spots at apex are not quite in line, the third being nearer base than the others. Expands 1.90 to 2.00. Habitat, Indian River, Florida.

574. NISONIADES PROPERTIUS SCUD-BURG.

CALIFORNIA BROWN.

Closely allied to *N. juvenalis*, but differs in having the outer line of arrow-shaped spots on fore wing more oblique, that is the lowest is nearer the base of the wing than the others, and of the four white spots in apex of fore wing, one, two, and four are in line, but the third is nearer the base, while the spot in cell is smaller. Habitat, California.

575. NISONIADES NAEVIUS LINT.

NAEVIUS BROWN.

Allied to *N. juvenalis*, but much darker, nearly black, four minute spots in apex of fore wings, the fourth sometimes missing, one spot below, and none in cell. Expands 1.45 to 1.65. Habitat, Indian River, Florida.

576. NISONIADES PACUVIUS LINT.

WESTERN BROWN.

Similar to *N. martialis*; four spots in apex of fore wings, upper a mere dot, two below these, and below them are two white spots not glassy. Fringes on fore wing, brown, pure white on hind pair.

577. NISONIADES TACITUS EDW.

MARGINED BROWN.

Near *N. perseus*, but differs in having four silvery spots in a zig-zag line at apex of fore wing, one below these and one obscure at end of cell, outer margin pure brown, free from white scales. Expands 1.60. Found in Arizona.

578. NISONIADES CLITUS EDW.

CLITUS BROWN.

Allied to *N. tacitus*, differs in being so much dusted with white above, and clothed with long white hairs as to greatly obscure the ground color. There are four glassy spots in apex of fore wing, three in a straight line, the fourth a little nearer base, a dot below, and one at end of cell. Expands 1.50 to 1.60.

579. NISONIADES FUNERALIS SCUD.-BURG.

MOURNING BROWN.

Similar to *N. naevius*, darker above with markings inconspicuous, there are a few white spots on terminal portion of fore wings, four small

white spots in apex and a larger one below; one at end of cell; no spots on hind wings above, spotted below as in *N. brizo*. Expands 1.75. Found in Texas, Arizona, and Southern California.

580. *NISONIADES TRISTIS* Bd.

SAD BROWN.

Closely allied to *N. funeralis*, but differs in the presence of a spot in cell, and in the fringes of hind wings being grayer, not pure white. Found in California and Arizona.

GENUS LXII. *PHOLISORA*. BLACK SKIPPERS.

Size, small. Colors, very dark, with no prominent markings. Fore wings, rather angular. Hind wings, short and rounded. Club of antennae, slightly bent. TYPE *P. CATULUS*. (Plate X, 10.)

581. *PHOLISORA CATULUS* Fab.

WHITE-DOTTED BLACK.

Blackish above, paler below. There is a sub-marginal series of white dots on fore wings, and a series of five near apex. Spots larger beneath; body dotted with white. Expands 1.10 to 1.20. Habitat, whole of the United States.

582. *PHOLISORA PIRUS* Edw.

SIX-SPOTTED BLACK.

Dark glossy brown above, tinged with reddish below; three small yellow spots on fore wing near apex, and two dots below them, and another near end of cell; spots repeated below. Expands 1.00. Habitat, Southern Colorado, New Mexico, and Arizona.

583. *PHOLISORA CEOS* Edw.

CEOS BLACK.

Dark blackish brown above, with a few scattering whitish scales, two indistinct bands on outer margin of fore wings, and there are two white dots near apex: beneath, a little paler, spots sometimes repeated, sometimes not. Expands 1.15.

584. *PHOLISORA HAYHUSTII* Edw.

HAYHUST'S BLACK.

Blackish brown above. Both wings crossed by two bands of a deeper color; two white dots near apex and one below these; beneath, a little

paler. Expands 1.00 to 1.10. Habitat, West Virginia to Kansas, Florida, Texas, and New Mexico.

585. PHOLISORA LENA EDW.

LENA'S BLACK.

Glossy dark brown above; fore wings with three small spots near apex; a small spot in cell, and three minute spots on outer portion of wing. Beneath, dusky, grayish on apex of fore wing and on hind pair. Expands 1.10. Habitat, Montana.

GENUS LXII. SYSTASEA. GRAYS.

Generally similar to Nisoniades. Colors, brighter. Wings, broader.

586. SYSTASEA ZAMPA EDW.

ZAMPA GRAY-WING.

Pale grayish above, mottled with faint greenish, a line of small, connected glassy spots cross both wings, and half way to apex on fore pair is a bar of three similar spots. Whitish beneath, brown and grayish mottled, markings repeated, and in addition, nearer base of hind pair are two indistinct spots, one in middle, the other on upper margin. Expands 1.20. Habitat, Arizona and Texas.

GENUS LXIII. EUDAMUS. TAILED SKIPPERS.

Size, medium to large. Wings, broad; hind pair furnished with a more or less prominent tail. Club of antennae bent into an elongated hook. TYPE E. PYLADES. (Plate X, 11.)

587. EUDAMUS ELECTRA EDW.

NORTHERN TAILED SKIPPER.

Similar to E. pylades, eleven spots on fore wings, two near end of cell, two in cell, and below them two, larger outside these, five others in an irregular curve. Expands 1.50. Habitat, Hamilton, Ontario.

588. EUDAMUS PYLADES SM-ABB.

BROWN-TAIL.

Dark brown above, with bronzy reflections, these are three brownish glassy spots near apex, three more within these also on upper margin and in the male three more below, forming a triangle on outer portion of wing; female has two or three more. Beneath, paler, on outer

portion of wings, spots repeated on fore pair; hind pair crossed by two double bands. Expands 1.25 to 1.60. Habitat, New England to Florida, Dakota, Colorado, California, Ontario, and Quebec.

Fig. 56.



Illustrating the genus *Pamphila*; upper side, fore wing; a, *sassacus*; b, *metea* (lower side hind wing); c, *leonardus*; d, *brettus*; e, *huron*; f, *pylades*; g, *otho*; h, *mystic*; i, *cernes*; j, *manataaqua*; k, *metacomet*; l, *accius*.

589. *EUDAMUS NEVADA* SCUD.

NEVADA BROWN.

Quite like *E. pylades*, but much smaller, and the under surface is very delicately marked with short, transverse lines of white, giving the outer half of wings a hoary appearance. Expands 1.10. Habitat, Texas, Colorado, and Nevada.

590. *EUDAMUS BATHYLLUS* SM-ABB.

WHITE-SPOTTED TAILED BROWN.

Quite like *E. pylades*, but the spots are larger, forming a nearly continuous, oblique band from the upper to near the lower margin on fore wing, which is narrower, Fig. 58, a. Expands 1.25 to 1.50. Habitat, West Virginia to Florida, Kansas and New Mexico; rare in New England.

591. EUDAMUS MOSCHUS EDW.

MOSCHUS BROWN-WING.

Glossy brown, with nine whitish, glassy spots on fore wing, four in apex, three across middle in an oblique line, one in cell, and another above this. Under side of both wings brown, mottled with dashes about apex of fore wings and crossed by two black bands, and an additional half band on hind pair, spots on fore wings, repeated. Expands 1.30 to 1.70. Habitat, Arizona.

592. EUDAMUS HIPPAULTUS EDW.

ARIZONA BROWN-WING.

Quite like *E. moschus*, differs in having smaller spots, and in being more heavily washed with white below. Expands 1.30. Habitat, Arizona.

593. EUDAMUS DRUSIUS EDW.

DRUSIUS BROWN-WING.

Upper side, glossy brown, with eight glassy spots on fore wing; four in apex, three below, and one at right angles with the lowest of the three. Dark brown beneath; spots repeated. Expands 1.70. Habitat, Southern Arizona.

594. EUDAMUS EPIGENA BUTL.

EPIGENA BROWN-WING.

Blackish brown above, with nine glassy spots; three in apex, three in an oblique line below, with a fourth at right angles, two in middle of upper margin. Lower side brown, spot on fore wings repeated, dark brown of hind wings crossed by two black bands with irregular outlines, outer margin, broadly bordered with white. Expands 2.00 to 2.10. Habitat, Texas and Arizona.

595. EUDAMUS LYSIDUS SM-ABB.

GLAUCOUS BROWN-WING.

Large; brown above, white-fringed, in middle of four wings are four reddish buff, glassy spots, Fig. 78, e. Beneath, paler, spots on fore wings repeated, mottled with black on hind pair, and there is a large patch of silvery white an outer border. Expands 1.50 to 2.00. Habitat, Massachusetts, where it is rare, to the Gulf of Mexico, and Mississippi Valley.

596. EUDAMUS CELLUS Bd.Lec.

YELLOW-BANDED BROWN-WING.

Blackish brown above, fore wings crossed by a broad continuous band of yellow, and three spots and a dot in apex; blackish-fringed, lower side, fore wings similar to upper, grayish on outer portion; hind wings, purplish brown, with three irregular, rather indistinct, darker brown bands; on outer margin is a series of deep brown crescents, surrounded by scattering pale blue scales. Expands 1.90 to 2.00. Habitat, West Virginia to the Gulf of Mexico, Texas and Arizona.

597. EUDAMUS HESUS WEST-HEW.

REDDISH BROWN-WING.

Large; light reddish brown above; in center of fore wing is a cluster of three light buff spots, arranged as in Fig. 58, b, and two smaller in apex; below these, two black dots and two more black dots in middle of lower side; hind wings with a row of sub-marginal black spots and another row at base. Expands 2.25. Habitat, Texas.

598. EUDAMUS ZESTOS Edw.

YELLOW-SPOTTED BROWN-WING.

Quite like above to *T. tityrus*, band on fore wing slightly wider below; beneath, strongly tinged with purplish, and the white spot is entirely absent on hind wings, being represented by a pale band only. Expands 2.00 to 2.40. Habitat, San Marco Island and Sanford, Florida, also Bahamas and Southward.

599. EUDAMUS TITYRUS Fab.

SILVER-SPOTTED BROWN-WING.

Brown above, with an oblique band of four reddish buff spots on fore wing a square spot beyond these and three spots in apex. Beneath paler, washed with whitish on outer margin, spots repeated on fore wing, and a large silvery white patch on hind pair, Fig. 58, b. Expands 2.10 to 2.40. Habitat, British America, Ontario, Quebec and, Southward.

600. EUDAMUS PROTEUS LINN.

TAILED BROWN-WING.

Tails on hind wings greatly elongated, Fig. 58, d. Brown above, fore wings with an oblique band of brownish glassy spots, a square one outside these, and another band of four small spots in apex; hind wings

clothed with greenish hairs along lower margin. Beneath paler, with strong purplish reflection, a marginal band on hind wings including tail, a sub-marginal band on both wings, joining marginal at inner angle on hind pair, and three or four spots at base of hind wings, all dark brown. Expands 1.60 to 2.00. Habitat, Southern States, rarely in New York and Southern New England.

601. *EUDAMUS ALBOFASCIATUS* HEW.

WHITE-BANDED LONG-TAIL.

Tail long; similar to *E. proteus* above, spots in band, smaller and three spots only in apex, similar beneath on fore wing, gray at apex and marked with a triangular brown spot. Hind wing dark brown, crossed obliquely by a central band of white and a sub-marginal band of gray. Expands 2.00. Habitat, Texas.

602. *EUDAMUS DORCUS* EDW.

DORCUS' LONG-TAIL.

Tails, long; similar to *E. proteus*, but differs mainly in having a line of whitish spots on hind wings above, and the hairs are dark gray. Much overwashed with whitish beneath, and there are two narrow blackish bands on hind wings connected by a ligament below cell. Expands 2.00. Habitat, Arizona.

603. *EUDAMUS SIMPLICIUS* STOLL.

PLAIN LONG-TAIL.

Quite similar to *E. proteus*, but there are no spots on fore wings above, and two bands only on hind pair below, the outer of which does not include tail. Expands, 1.25. Habitat, Texas and Arizona.

GENUS LXIV. *ACHLYODES*. ALLIES.

Size, medium. Colors, dark. Hind wings with the inner angle produced. Club, bent.

604. *ACHLYODES THRASO* HUB.

THRASO SKIPPER.

Dark brown above, purplish-tinted; fore wings crossed by a brown band, and there is an indistinct sub-marginal band of spots. Hind wings, blackish, crossed near middle by two rows of indistinct black spots. Brown beneath, grayish at apex of fore wings, unspotted. Expands 1.60. Found in Texas.

GENUS LXV. ERYCIDES. GREEN SKIPPERS.

Size, large. Colors, dark, usually marked with greenish. Form quite similar to that of the large species of *Eudamus*. TYPE *E. URANIA*. (Plate X, 12.)

605. *ERYCIDES URANIA* WEST-HEWT.

CLEAR-SPOTTED GREEN-WING.

Blackish above, white-fringed; a sub-marginal row of metallic greenish spots on both wings, and within them are long green lines in each interspace. On fore wings are three spots in a band, two outside them, and a triangular cluster of five in apex, all perfectly transparent. Beneath, spots repeated on fore wings, but with less greenish; darker on hind pair where the green is intensified and condensed into four bands of spots. Expands 2.25. Habitat, Texas and Southward.

606. *ERYCIDES TEXANA* SCUD.

TEXAS GREEN-WING.

Similar to *E. urania*, but lacks the green markings of upper surface of fore wings and the green of hind wings is lighter. Expands 2.25. Habitat, Texas.

607. *ERYCIDES SANGUINEA* SCUD.

RED-SPOTTED GREEN-WING.

Blackish above; in cell of fore wing is a blood red spot and another smaller, above it; base of fore wings streaked with metallic blue; white-fringed on both wings. Lower surface, similar. Expands 2.10. Habitat, Texas.

608. *ERYCIDES BATABANO* LEF

BLUISH GREEN-WING.

Above, smoky brown strongly violet-tinted, fore wings without markings; hind wings with a sub-marginal series of elongated bluish green spots. Beneath, on fore wings paler, purplish-tinted, a little greenish along upper margin and on base: hind wings similar to above, but deeper in color. Expands 2.30 to 2.60. Habitat, Florida and Cuba.

609. *ERYCIDES AMYNTAS* FAB.

KEY WEST SKIPPER.

Dark brown above, with strong purplish reflections, a white glassy bar extends across cell of fore wing, below this is a larger spot, and an-

other below this; near apex is a row of three small spots. Beneath spots of fore wings repeated, along upper border, apex, and outer margin of fore wing, and the entire surface of hind pair, excepting two bands of spots and the inner angle, rich purple; remainder of surface dark brown. Expands 2.00. Habitat, Key West, Florida.

GENUS LXVI. PYRRHOPYGA. YELLOWISH SKIPPERS.

Size, large. Colors, rather bright. Fore wings rounded at apex. Hind wings with inner angle produced a little. Club, bent.

610. PYRRHOPYGA ARAXES HEW.

OCHEKY SKIPPER.

Dark brown above, along outer margin of both wings; on fore pair are ten glassy yellow spots, three near apex, a fourth near these toward base, three in a band below these and three on end of cell. Lower side of both wings yellow ochre, excepting outer half of fore wings and along outer border of hind wings; spots repeated. Expands 2.10. Habitat, Arizona and Southward.

GENUS LXVII. MEGATHYMUS. MOTH-LIKE SKIPPERS.

Size, large. Colors, dull yellowish. Fore wings, narrow and rounded at apex. Hind wings, oval; body, thick and moth-like. Club of antennae, slightly bent.

611. MEGATHYMUS YUCCAE Bd-LEC.

YUCCA SKIPPER.

Deep umber above, base of both wings tinged with yellow, fore wings marked with yellow as in Fig. 59, a. Hind wings unmarked in male, with four dots near outer border in female; brown beneath, brighter than above, outer portions of both wings pearly gray, with a patch of the same in middle of upper border of hind wing and a white crescent below it, spots of fore wings repeated. Expands 2.50 to 3.00. Found in Southern States, New Mexico, and Arizona.

612. MEGATHYMUS COFAQUI STR.

STRECKER'S MOTH SKIPPER.

Quite like *M. yuccae*, but differs in having five spots only on outer portion of fore wing, and in being more yellow at base. The female

has the spots in the cell of fore wing joined to those below. Expands 2.25 to 2.60.

Fig. 57.



Illustrating the genus *Nisoniades*: upper side fore wing; e, brizo; f, icelus; g, lucillus; h, perseus.

613. MEGATHYMUS NEUMOEGENII EDW.

NEUMOEGEN'S MOTH SKIPPER.

Upper margin of fore wing brown, both wings with a broad black border, on upper margin beyond cell is a black patch which extends to middle vein, and there comes in contact with a larger patch, between this and the border is a broad orange band, extending quite across wing but restricted opposite cell; on upper margin is an orange patch before the black patch. Hind wings with the center black, much concealed by long orange hairs, and between this and border is a light band. Dark brown beneath, overwashed with grayish on apex of fore wing, orange band repeated, replaced by white on upper portion, black patch on upper border repeated. Hind wings brown, overwashed with grayish, with a white spot near base, otherwise unmarked. Female has rather more orange. Expands 1.00 to 2.20. Habitat, Arizona.

Fig. 58.



APPENDIX.

The following species of Butterflies have been omitted from the body of the work through various reasons.

15a. *PAPILIO TURNUS AUSTRALIS*, similar to typical *P. turnus*, but much darker in color, the yellow being as dark as that of *P. cresphontes*, and there is very little blue above. This is the form of which mention is made on Page 12. Size, large.

38c. *PIERIS RAPAE IMMACULATA* Skinner, differs from the type in the entire absence of spots from both surfaces. Habitat, given as Pennsylvania, but early spring specimens taken in Newton, Massachusetts, are not only without spots above, but are also almost entirely without markings of any description, and the black at apex is restricted to the extreme edge of the wing and the spots below are represented by a few scales.

59° *KRICOGONIA LANACE* LINT.

LINTNER'S YELLOW AND WHITE BUTTERFLY.

Similar to *K. lyside*, but lighter yellow at base of both wings above, there is no indication of a spot at end of central cell on either wing, but there is a band of faintly defined dusky spots crossing hind wing beneath. Expands 1.60. Habitat, Rio Grande, Texas.

62. *COLIAS MEADII*, to description add the following; female, differs in having the central spot on fore wings more prominent and light centered, and in having a row of orange spots on the black bordering of both wings. Expands 1.70 to 1.90. Habitat, Mountains of Colorado, Montana, and New Mexico. Occurs in July.

62° *COLIAS ELIS* STREC.

ELIS BUTTERFLY.

Closely allied to *C. meadii*, but much more overwashed with greenish and the size is larger. Expands 1.80 to 2.30. Habitat, British Columbia.

67. *Colias hageni*, Mr Edwards now considers the same as *C. eriphyle*!

90a. *TERIAS LISA CLAPPII*, like typical *T. lisa*, but the black border of hind wing above is confined to a small spot in upper angle in the male, and in the female to several spots along outer border. I have concluded to indicate this well marked form of *T. lisa* as above. Specimens of these butterflies were obtained by my friend, Mr. E. B. Clapp, of Dorchester, at Enterprise, Florida, in 1889.

93^a. *TERIAS BLAKEI*.

BLAKE'S BUTTERFLY.

About the size and form of *T. lisa*. Male, greenish white above, narrow border to apex of fore wings and a spot on upper angle of hind pair, dusky; beneath more yellow tinted. Apex of fore wings, basal portion of upper border, spot on upper angle of hind pair, and faint bandings on latter, rather bright purplish red. The larger spots on both wings are preceded by a dusky spot. Female, similar, with the dark spot above on hind wing a little larger. Expands 1.10 to 1.20. I have named this fine species which I cannot find described anywhere, for Sir Henry Arthur Blake, Governor of Jamaica, as a slight token of my appreciation of his kindness in aiding me in my scientific researches during one of my trips to the Bahamas, at which time he was Governor there. It is common on all of the Bahamas which I visited, in company with two or three other species of the genus, and I have a female in my collection which I obtained at Sandford, Florida, Oct. 1st., 1887.

134^a. *ARGYNNIS ATOSSA* EDW.

PALE BUFF-WING.

Nearest to *A. adiante*, but very pale above; outer row of markings on hind wings is nearly obsolete, and quite disappear on hind pair, there being one basal row and the C-shaped mark in cell remaining and these are very faint. Beneath, very pale buff, orange on base of fore wings, in which the black markings show clearly, outside this are no markings and those on hind wings are faintly visible only. Expands 1.80 to 2.30. This is the palest of all the species in the genus. Taken by Mr. H. K. Burrison in Southern California, July, 1889.

159°. *MELITAEA AUGUSTA* EDW.

AUGUSTA'S CHECKER.

Similar to *M. chalcodon*, but the red predominates; first a marginal band of small red spots, second, yellow crescents, red ringed, third, either wholly yellow, or yellow with red edges, on hind wings wholly red; fourth, red, yellow on hind wings. At end of cell are four or five yellow spots. Two yellow spots below cell, with black between, two yellow spots in cell, with a red line between them. Beneath, red, yellow spots repeated much enlarged; outside cell is a large red spot, heavily black-edged; hind wings have margin red, second row yellow, third, red, fourth, yellow, then red to base. Expands 1.60 to 2.20.

165°. *MELITAEA BRUCEI* EDW.

BRUCE'S CHECKER.

Dark brown, common marginal band red, in some, yellow in others, or partly red and partly yellow; third row, red on fore wings and yellow on hind pair, on hind pair the reverse. In one form the red predominates, in another, the yellow. Expands 1.50 to 1.70. Habitat, Montana, Washington, and British America, in the Rocky Mountains.

165°. *MELITAEA TAYLORI* EDW.

TAYLOR'S CHECKER.

Similar to *M. rubicunda*, but smaller, spots beneath white, or white yellow-tinted. Expands 1.70 to 1.80. Habitat, Vancouver's Island.

Note on *Phyciodes*, *P. camillus* and its two sub-species, *pallada* and *mata*, have been taken at Banf, Canada, by Mr. H. K. Burrisson.

204. *SYNCHLOE ADJUTRIX*, an additional description is as follows. Black above, with a sub-marginal row of white dots, two at end of cell, two above these, a little nearer base, one in cell, one above and one below it, these three forming an oblique line. On hind wings is a large chestnut patch, with a black dot in cell. Beneath, spots on fore wings repeated, enlarged, two extra at base and three only on outer margin. On hind wings a row of sub-marginal yellow spots, then a row of white dots; then a band of chestnut red on lower two-thirds of wing against a ochreous yellow patch, that occupies base and contains three rows of black spots. Expands 2.50.

235°. VICTORINA STENELES LINN.

GREEN-BANDED BUTTERFLY.

Size, large, outer margin of wings scalloped. Hind wings, with a short tail. Black above with grass green markings as follows; a sub-marginal band of round spots on both wings, followed by a wide band, broken on upper part of fore wing into a double row, then continuous across hind pair. On lower side spots repeated, enlarged, covering a large portion of the surface, the ground color is yellowish white. Habitat, West Indies, Mexico, Central America to Brazil, and Florida.

258°. NEONYMPHA MITCHELLII FRENCH.

MITCHELL'S QUAKER.

Similar to *N. areolatus*, but differs in always having four eye spots on lower side of fore wings and six on hind pair, and all circular, not oval. Transverse lines on hind wings below brownish yellow. Expands 1.20 to 1.30. Habitat, Cass County, Michigan.

276a. EREBIA EPIPSODEA SINE-OCCELLATA Skinner. Differs in having the bright orange patch on fore wing above, divided into four sections, and the two black dots are without the surrounding white. Habitat, Qu'appele, North West Territory.

376. THECLA SHERIDANII EDW.

SHERIDAN'S BUTTERFLY.

Size and form of *T. dumetorum*. Plain black above. Lower side of both wings green; crossing both wings is a narrow white band. Expands 1.10. Habitat, Montana.

446. LYCAENA STRIATA EDW.

STRIPED BLUE.

Yellowish orange above, bordered by a fine black line on which rests black crescent-shaped spots. Beneath, fore wing orange on basal half, black spot at end of cell; black markings repeated, paler, and six upper sub-marginal spots are slightly silvered. Hind wings, yellowish buff, brownish at base. There are three rows of spots crossing hind wings, the larger of which are well silvered. In cell is a red spot. Female, paler above, yellowish orange tinged.

504°. PAMPHILA BARACOA LUC.

INTERMEDIATE SKIPPER.

Similar to *P. cernes* in general markings, size larger, and colors much deeper, the orange is restricted above dash at both ends leaving a brown space between it and the three dots in apex. Expands 1.15. Habitat, Cuba and Florida. This species has been re-described by French as *P. myus*.

584°. PHOLISORA LIBYA SCUD..

LIBYA BLACK-WING.

Dark glossy brown above, greenish-tinged; at apex are three white spots, and an inconspicuous white spot below them. Beneath pale, markings on fore wings repeated; a band of white spots crosses hind wings. Expands 1.00. Found in Utah.

61a. COLLAS CAESONIA ROSEA Mc Neal, similar to type but with the apex of fore wings below and hind wings much suffused with pink, from a single specimen taken at Melen, Illinois.

Fig. 59.

*Megathymus yuccae*, upper side fore wing, female.

INDEX.

- Achlyodes, 210
 thraso, 210
 Amblyscirtes, 196
 aenus, 197
 cassus, 198
 eos, 197
 nanno, 198
 nysa, 197
 samoset, 197
 simius, 198
 textor, 198
 vialis, 196
 Anartia, 95
 jatrophae, 95
 Ancyloxyphia, 169
 numitor, 169
 Anthocharis, 25
 ausonides, 27
 cethura, 27
 creusa, 25
 genutia, 29
 hyantis, 26
 julia, 29
 lanceolata, 25
 morrisoni, 26
 olympia, 26
 pima, 29
 reakirtii, 28
 rosa, 27
 sara, 28
 stella, 28
 thoosa, 28
 Apatura, 103
 alicea, 104
 antonia, 104
 celtis, 103
 clyton, 104
 cocles, 105
 flora, 105
 leilia, 105
 Appendix, 215
 Argynnis, 50
 adiante, 61
 alberta, 65
 alcestris, 54
 aphrodite, 54
 artonis, 61
 atlantis, 55
 atossa, 216
 bellona, 66
 behrensi, 57
 bischoffii, 62
 bremnerii, 56
 butlerii, 64
 callippe, 58
 chariclear, 64
 chitone, 58
 clio, 61
 columbia, 55
 coronis, 58
 cybele, 53
 cypris, 54
 diana, 51
 edwardsii, 59
 egleis, 63
 electa, 55
 epithore, 66
 erinna, 62
 eurynome, 62
 freya, 65
 frigga, 66
 halcyone, 51
 helena, 63
 hesperis, 56
 idalia, 51
 improba, 66
 inornata, 60
 irene, 60
 lais, 55
 laura, 60
 leto, 52
 liliana, 59
 macaria, 60
 myrina, 63
 montinus, 64
 monticola, 57
 moniviaga, 62
 nausicaa, 58
 nevadensis, 58
 nictocris, 52
 nokomis, 52
 opis, 61
 polaris, 65
 rhodope, 67
 rupestris, 60
 semiramis, 61
 tricularis, 63
 zer ene, 56
 Agraulis, 49
 vanillae, 49
 Calephelis, 128
 australis, 129
 borealis, 128
 caenius, 128
 nemesis, 129
 Callidryas, 30
 agarithe, 32
 eubule, 30
 philea, 32
 sennae, 31
 Carterocephalus, 168
 mandan, 169
 omaha, 169
 Chionobas, 120
 calis, 121
 crambis, 124
 chryxus, 121
 gigas, 120
 induna, 120
 invalida, 121
 nevadensis, 121
 semidea, 123
 subhyallina, 124
 tarpera, 123
 taygete, 123
 uhleri, 122
 varuna, 122
 Chrysophanes, 147
 adrienne, 153
 arota, 148
 clione, 150
 dorceas, 152
 edithia, 149
 epixanthe, 152
 fasciata, 153

- florus, 152
 gorgon, 150
 helloides, 151
 hermes, 149
 hypophleas, 153
 mariposa, 151
 rubidus, 154
 sirius, 155
 snowi, 154
 thoe, 150
 virginensis, 148
 xanthodes, 149
 zeroe, 151
 Coenonympha, 109
 ampelos, 111
 brenda, 111
 california, 110
 elko, 110
 eryngi, 110
 galactinus, 110
 inornata, 111
 kodiak, 111
 ocharaca, 111
 pulla, 110
 pamphilodes, 112
 Colaenis, 48
 julia, 48
 delila, 49
 Colias, 33
 alexandria, 38
 albinic, 37
 ariadne, 36
 behrii, 42
 boothii, 35
 caesonia, 34
 chippawa, 41
 christina, 38
 chione, 36
 chrysomelas, 38
 edwardsii, 39
 elis, 215
 emelia, 39
 eriphyle, 37
 eurydice, 34
 hagenii, 37
 hartfordi, 37
 hecla, 35
 hela, 35
 interior, 40
 keewaydin, 36
 hagenii, 37
 meadii, 34, 215
 melanic, 37
 moina, 41
 nastes, 41
 occidentalis, 38
 palaeno, 41
 pelidne, 40
 philodice, 36
 rosea, 219
 scudderii, 40
 Copaeodes, 170
 arene, 171
 eunus, 170
 myrtis, 170
 procris, 170
 wrighteii, 170
 Cystineura, 85
 amymone, 86
 Danais, 46
 archippus, 46
 berenice, 47
 strigosa, 47
 Debis, 106
 portlandia, 106
 Dricinna, 48
 klugii, 48
 Eurema, 95
 lethe, 96
 Eresia, 82
 frisea, 82
 punctata, 83
 texana, 83
 Eudamus, 206
 albofasciatus, 210
 bathyllus, 207
 cellus, 209
 dorcus, 210
 drusus, 208
 electra, 206
 epigena, 208
 hesus, 209
 hippaltus, 208
 lysidus, 208
 moschus, 200
 nevada, 207
 pylades, 206
 proteus, 209
 simplicius, 210
 zestos, 209
 Eumenia, 129
 atala, 129
 Eunice, 96
 monima, 96
 Euptoieta, 67
 claudia, 67
 hegesia, 67
 Eurygona, 127
 abreas, 128
 Erycides, 211
 amyntus, 211
 batabano, 211
 sanguinea, 211
 texana, 211
 urania, 211
 Erebia, 112
 callias, 114
 discoidalis, 112
 epipsodea, 114
 ethela, 114
 fasciata, 112
 haydenii, 113
 magdalena, 115
 mancinus, 113
 rossii, 113
 siner-occellata, 218
 sofia, 114
 vesagus, 113
 Erycinidae, 125
 Fenisea, 147
 tarquinus, 147
 Geirochelus, 115
 tritonia, 115
 Grapta, 86
 comma, 86
 faunus, 88
 gracilis, 89
 interrogationis, 86
 hylas, 88
 J-album, 90
 progne, 90
 rusticus, 88
 satyrus, 87
 silenus, 87
 silvius, 89
 zephyrus, 89
 Heliconia, 45

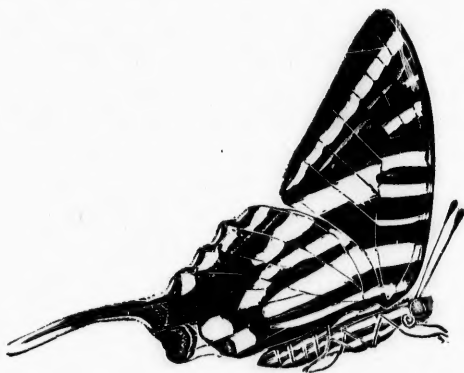
- charitonia, 46
 Hesperidae, 168
 Heterochroa, 103
 californica, 103
 Hipparchia, 115
 dionysius, 116
 ridingsii, 115
 Hypolimnas, 99
 mississippi, 99
 Junonia, 93
 coenia, 94
 genoveva, 94
 Kricogonia, 32
 lanace, 215
 lyside, 33
 fantasea, 33
 Lemonias, 125
 ares, 127
 cythera, 127
 duryi, 126
 mormo, 127
 nais, 126
 palmerii, 125
 virgulti, 125
 Libythea, 124
 carinenta, 125
 bachmanii, 124
 Limenitis, 99
 arthemis, 100
 burrisonii, 102
 floridensis, 101
 hulstii, 102
 sine-fascia, 101
 lorquini, 102
 ursula, 100
 weidemeyerii, 100
 Lycaena, 155
 acmon, 165
 alce, 166
 amica, 156
 ammon, 167
 amyntula, 166
 annetta, 161
 antiacis, 158
 aquilo, 160
 arizonensis, 161
 ardea, 158
 aster, 134
 battoides, 164
 behrii, 158
 cinerea, 162
 comyntas, 165
 couperii, 159
 cyna, 166
 daedalus, 156
 echo, 162
 enoptes, 161
 exilis, 168
 filenus, 167
 glaucon, 164
 gyas, 166
 heteronia, 166
 icaroides, 156
 kodiak, 158
 lotis, 163
 lycea, 155
 lygdamus, 159
 lucea, 162
 marginata, 162
 marina, 168
 mayicopa, 156
 mellisa, 165
 monica, 166
 neglecta, 162
 nigra, 162
 orcus, 159
 piasus, 162
 pseudargiolus, 162
 saepiolus, 156
 sagittigera, 156
 scudderii, 163
 shasta, 164
 sonorensis, 160
 speciosa, 159
 rustica, 211
 theonus, 167
 violacea, 162
 xerxes, 158
 Lycaenidae, 129
 Melitaea, 68
 acastus, 72
 alma, 75
 ancia, 70
 arachne, 77
 augusta, 217
 baroni, 70
 bollii, 76
 bruceii, 217
 chalcedon, 69
 chara, 75
 colon, 69
 cooperi, 69
 dwinellei, 69
 dymas, 74
 edetha, 71
 fulvia, 76
 gabbii, 73
 harrisii, 73
 helva, 71
 hoffmanni, 72
 minuta, 76
 nubigena, 70
 nymphs, 77
 palla, 72
 perse, 74
 phaeton, 68
 quino, 70
 rubicunda, 70
 sterope, 72
 taylorii, 217
 thekla, 76
 ulrica, 73
 whitneyi, 72
 Nathalis, 24
 iole, 24
 irene, 25
 Neophasia, 18
 menapia, 18
 suffusa, 19
 Nymphalidae, 45
 Neonympha, 107
 areolatus, 108
 canthus, 107
 eurytris, 108
 gemma, 107
 mitchellii, 218
 rubricata, 108
 sosybius, 109
 viola, 109
 Nisoniades, 201
 afranius, 293
 alpheus, 202
 ausonius, 203
 brizo, 201

- clitus, 201
 funeralis, 204
 icelus, 204
 juvenalis, 203
 lucilius, 202
 martialis, 203
 naevius, 204
 persius, 202
 petronius, 204
 somnus, 202
 tristis, 205
 Pamphila, 171
 accius, 189
 agricola, 181
 arpa, 192
 attalus, 179
 baracora, 219
 bellus, 188
 brettoides, 184
 brettus, 184
 bimacula, 191
 byssus, 194
 cabelus, 176
 campestris, 182
 cernes, 187
 cestus, 191
 colorado, 174
 comus, 194
 chusa, 184
 delaware, 193
 deva, 189
 dion, 192
 draco, 184
 eufala, 195
 ethlius, 190
 fusca, 195
 harpalus, 176
 hianna, 196
 hobomok, 172
 horus, 189
 huron, 183
 lagus, 194
 lasus, 173
 leonardus, 180
 licinus, 178
 loammi, 189
 lunus, 189
 maculata, 190
 manitoba, 175
 manataqua, 187
 mardon, 186
 massasoit, 172
 melane, 193
 metea, 177
 meskei, 180
 milo, 181
 morrisonii, 188
 mystic, 186
 napa, 177
 nemorum, 181
 nereus, 195
 nevada, 174
 ocola, 190
 oregona, 175
 osyka, 194
 otho, 185
 ottoe, 176
 palatka, 193
 panoquin, 190
 pawnee, 176
 peckius, 185
 phylace, 194
 phylaeus, 194
 pittacus, 191
 pocahontas, 172
 pontiac, 192
 pratincola, 182
 python, 191
 quadraquina, 172
 juba, 175
 rhena, 192
 rhesus, 177
 ruricola, 173
 sabuleti, 185
 sassacus, 173
 seminole, 179
 snowi, 179
 siris, 186
 sylvanoides, 181
 taxiles, 173
 uncas, 178
 verna, 187
 verus, 182
 vestris, 188
 vitator, 196
 vitellius, 193
 yuma, 180
 zabulon, 172
 Paphia, 105
 morrisonii, 106
 troglodyta, 105
 Papilio, 3
 abbotii, 4
 americanus, 6
 ammoni, 13
 ajax, 3
 arizonensis, 13
 asterias, 8
 asteroides, 9
 brevicauda, 8
 calverleyi, 9
 cresphontes, 14
 daunus, 11
 eurymedon, 12
 glaucus, 12
 indra, 7
 machaon, 5
 marcellus, 4
 nitra, 6
 oregonia, 6
 palamedes, 10
 pergamus, 7
 philenor, 4
 pilumnus, 14
 polydamus, 15
 rutulus, 12
 telamonides, 4
 thoas, 14
 troilus, 10
 turnus, 11
 walshii, 4
 zolicaon, 6
 Parnassius, 15
 behrii, 17
 clodius, 16
 eversmanii, 18
 hermodur, 17
 menetriesii, 16
 nomion, 17
 smintheus, 16
 thor, 18
 Pholisora, 205
 catulus, 205
 eros, 205

- hayhustii, 205
 lena, 206
 libya, 219
 pirus, 205
 Phyciodes, 77
 batesii, 79
 camillus, 80, 217
 carlotta, 78
 mata, 81, 217
 montana, 82
 morpheus, 79
 myletta, 81
 nycteus, 78
 orseis, 80
 pallida, 81, 217
 picta, 82
 pratensis, 80
 phaon, 78
 tharos, 78
 vesta, 78
 Pieris, 19
 acadica, 23
 amaryllis, 19
 beckerii, 20
 flava, 22
 hiemalis, 22
 hulda, 22
 ilaire, 19
 immaculata, 215
 manni, 24
 marginalis, 24
 monusta, 19
 napi, 22
 nelsoni, 21
 nove-angilae, 28
 olaracea, 22
 protodice, 21
 rapae, 23
 sisymbri, 20
 venosa, 22
 vernalis, 23
 virginensis, 23
 yreka, 23
 Pyrameis, 92
 atlanta, 92
 cardui, 93
 carye, 93
 huntera, 92
 Pyrgus, 199
 centaureae, 200
 coespitabis, 200
 ericetorum, 199
 locutia, 199
 philetus, 200
 nearchus, 200
 nyssus, 200
 oceanus, 199
 scriptura, 201
 tessalata, 200
 xanthus, 201
 Rhopalocera, 1
 Satyrus, 116
 alope, 116
 ariane, 117
 baroni, 117
 boopes, 117
 charon, 119
 gabbii, 118
 incana, 117
 maritima, 116
 meadii, 118
 nephele, 117
 oetus, 119
 olympus, 117
 paulus, 117
 pegalia, 116
 silvestris, 118
 stenele, 119
 texana, 116
 wheelerii, 118
 Synchronoe, 83
 adjutrix, 84, 117
 crocale, 85
 erodyle, 85
 janais, 84
 mediatrix, 84
 Systasea, 206
 zampa, 206
 Terias, 42
 blakei, 116
 clappii, 116
 damaris, 43
 elathea, 45
 gundlachia, 43
 jucunda, 45
 lisa, 44
 mexicana, 43
 nicippi, 42
 proterpia, 42
 westwoodii, 43
 Thecla, 130
 acadica, 133
 acis, 141
 adenostomatis, 138
 affinis, 144
 alcestris, 133
 apama, 140
 autolycus, 133
 auretorum, 140
 behrii, 145
 calanus, 135
 californica, 34
 chalcis, 39
 castalis, 141
 citma, 130
 clytie, 142
 columella, 141
 crysallus, 130
 dryope, 134
 dumetorum, 145
 edwardsii, 134
 eryphon, 145
 exoleta, 138
 favonius, 131
 fotis, 145
 fuliginosa, 156
 grunus, 130
 halesus, 131
 humuli, 132
 ines, 143
 iroides, 143
 irus, 144
 itys, 137
 laeta, 146
 leda, 143
 M-album, 131
 melinus, 133
 mossii, 144
 murivii, 138
 nelsoni, 138
 nippon, 144
 ontairo, 136
 poeas, 142
 putnamii, 139

- | | | |
|----------------------|-----------------|-------------------------|
| saepium, 139 | tacita, 138 | chiron, 98 |
| sheridanii, 146, 218 | tetra, 139 | coresia, 97 |
| siva, 140 | titus, 146 | eleucha, 98 |
| smilacis, 141 | whittfeldii 135 | petreus, 96 |
| spadix, 137 | Thymelicus, 171 | vanessa, 91 |
| spinetorum, 140 | garita, 171 | antiopa, 91 |
| strigosa, 136 | poweschiek, 171 | californica, 91 |
| sylvanus, 140 | Timetes, 97 | milbertii, 91 |
| | | Victorina steneles, 218 |

Fig. 60.



Papilio ajax.

